

RESEARCH METHODS IN SOCIAL SCIENCES

B.A.V. Sharma
D. Ravindra Prasad
P. Satyanarayana

RESEARCH METHODS IN SOCIAL SCIENCES

c

RESEARCH METHODS IN SOCIAL SCIENCES

Edited by

B.A.V. SHARMA

Professor of Political Sciences
Osmania University, Hyderabad

D. RAVINDRA PRASAD

Reader in Public Administration
Osmania University, Hyderabad

P. SATYANARAYANA

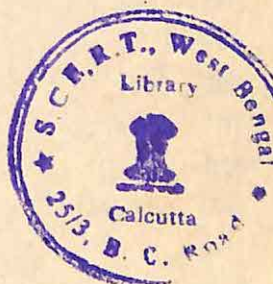
Deputy Director
ICSSR Southern Regional Centre, Hyderabad



STERLING PUBLISHERS PRIVATE LIMITED

NEW DELHI-110016

BANGALORE-560001



STERLING PUBLISHERS PVT LTD

L-10, Green Park Extension, New Delhi-110016

24, Race Course Road, Madhavanagar. Bangalore-560001

C.E.R.T. West Bengal

Date .. 10-3-87 ..

Rec. No. 3853 ..

007
SHA

Research Methods in Social Sciences

Copyright © 1983, Editors

First Reprint 1984

Second Reprint 1985

PRINTED IN INDIA

Published by S.K. Ghai, Managing Director, Sterling Publishers Pvt. Ltd.
L-10, Green Park Extension, New Delhi-110016. Printed at Ram
Printograph (India), New Delhi-110020.

Contents

<i>Preface</i>	...	vii
1. Role and Function of Social Sciences	...	1
2. Growth of Social Sciences in India	...	10
3. Traditional Methods—I	...	28
4. Traditional Methods—II	...	34
5. Scientific Method	...	43
6. Scientific Objectivity in Social Sciences	...	50
7. Objectivity in Social Science Research	...	55
8. Formulation of a Research Problem	...	61
9. Research Design	...	68
10. Types of Research Design: Descriptive and Diagnostic	...	90
11. Types of Research Design: Exploratory and Experimental	...	99
12. Sources of Social Science Information	...	113
13. Observation	...	128
14. Interview	...	140
15. Questionnaire	...	147
16. Content Analysis	...	159
17. Case Study	...	164
18. Projective Methods	...	172
19. Survey	...	182
20. Sampling	...	190
21. Measurement	...	200
22. Sociometry	...	207
23. Scaling Techniques	...	218
24. Processing of Data	...	232
25. Analysis of Data	...	245
26. Report Writing	...	249
27. Social Science Research: Some Issues	...	257
<i>Select Bibliography</i>	...	261
<i>Index</i>	...	267

Preface

This is an introductory book on research methods in social sciences useful for research workers and students in universities, colleges and research institutions, who have had limited background training or no training in research methodology. The idea for this book grew out of the demands by our fellow teachers and students and researchers who had experienced frustrations in teaching and conducting research activities. We hope that this book will be useful to students as well as teachers who educate their students on research methodology. We also hope that the book will be of use to any one who is interested in the scientific study of social phenomena and in the promotion of social science research.

This book is a cooperative effort of several of our colleagues and friends. We are indebted to all of them for their generous contribution of time and thought. We are grateful to all the contributors who wrote articles especially for this volume and for those who allowed us to reprint their papers originally presented to the foundation courses on research methods organised by the ICSSR Southern Regional Centre.

We thank C. Narendra Kumar and P. Harinath, who typed the final copy of the manuscript with patience and skill.

—*Editors*

Role and Function of Social Sciences

S.C. Dube

The social sciences are a major contemporary influence, but their growth has followed a slow and tortuous path. In the realm of understanding and explaining social phenomena the methods of persistence, of authority, and of intuition have had primacy over the method of science. When claims were first staked for a science of society (comparable in rigour and results with the more established sciences) and efforts were directed towards their realisation, the model of one or the other of the recognised sciences was invariably before the founding fathers. In consequence, they tried to develop a science of society in the image of another science the nature of whose field was quite different from that of the new disciplines encompassing man's social life. This caused considerable distraction and much wasted effort. Early endeavours in this field also met with a great deal of resistance, much of it born out of prejudice, or flowing from faulty and distorted understanding of purpose. The established disciplines did not take kindly to the new rivals; the latter were also partly to blame, for their performance did not visibly match their professions.

What happened in the west a century or more ago, appears to be repeating itself (with some significant differences) in the developing world today. In these countries the population at large remains unsensitised to the nature, the function, and the potential of the social sciences. The social scientists, themselves are somewhat uncertain of their aims and functions: their grandiose and sometimes awkward claims notwithstanding, they are self-consciously searching for a role for themselves and their specialities. The elite, at the same time, has demonstrated an unmistakable ambivalence towards them. The social sciences are often considered some kind of a luxury, a status symbol, whose relevance and applicability are still vague and undemonstrated. In despair the elite turns to them with impossible and utterly unrealistic expectations. Naturally, they get frustrated when they do not find what they seek.

Social Sciences and Society

The social sciences are a recognised stream of knowledge, and their practitioners must be viewed essentially as men of knowledge. In this role their functions are well-identified:

- (i) Discovery of facts and their interpretation;
- (ii) Discovery of problems;
- (iii) Systematisation of the existing body of knowledge;
- (iv) Dissemination of knowledge; and
- (v) Fighting for truth, i.e., for establishing the logical validity of an approach.

From this inventory I have deliberately left out another recognised function of men of knowledge—perpetuation of sacred truths through exact and faithful representation of their symbolic expression and through maintenance of self-contained, stable, unchallengeable, and sacred systems of unchanging truth. The reasons for this omission are obvious; the social sciences do not recognise the existence of any unchanging and unchallengeable 'sacred truths'. A vanishing minority of social scientists in India still possibly upholds this function, but it is neither articulate nor forceful. A variant of this category continues to propagate and defend the concepts and the methods as well as the dogmas and the rituals of its mentors located abroad or at home. But even this tendency, happily, is on the decline.

The functions enumerated above describe a major part of the role of the social scientist in society. In respect of the social life of man there undeniably are areas of almost total darkness: answers so far too many *what, where, when, how* and *why* questions of man's social life are not available. The situation is complicated by the prevalence of half-truths, pseudo-truths, and superstitions concerning the nature of social reality or parts of it. The path towards the understanding of social reality in all its diverse and complex ramifications can be illuminated by the discovery and interpretation of facts and by systematic integration of available knowledge. Facts suggest problem areas for deeper enquiry: well-formulated problems in turn, point not only to areas in which more facts are needed, but also suggest what kinds of facts are needed and how to collect them. The method of collecting facts governs, to a large extent, their reliability and validity as well as their effectiveness in answering the questions that originate the research endeavour. Sharpening of the tools of investigation and analysis and working towards their increasing perfection thus becomes essential. In the final analysis, the problems, the facts, and the techniques of investigation become meaningful by demonstrating their capacity to generate significant ideas that can be tested and proved and that have some applicability. To be socially useful these ideas as well as systematically organised and analysed facts require wide diffusion. It is not enough that they circulate within the narrow circle of the practitioners of an academic speciality: to make an impact they should percolate at least to the decision-making and moulders of public opinion.

Meaningful social research, therefore, would involve asking the right questions, fashioning tools that can find answers to them with economy and precision, and generating ideas characterised by adequacy of explanation and reliability of their diagnosis as well as prognosis. Its principal objective should be to provide understanding. This understanding would bring into focus problem areas and illuminate alternative paths of action with an estimate of their costs and consequences.

Social Sciences and Developing Societies

In the contemporary world, social sciences are as relevant to the rich nations as they are to the poor nations. Affluence generates a multitude of social and psychological problems that defy all attempts at handling them if this effort is not backed by an understanding of their overt and covert dimensions and ramifications. Poverty, on the other hand, poses a wide range of problems that impinge not only on the domestic policies of the new nations but on international developments also. The communications revolution has transformed the images and goals of men in developing societies; they do not accept their poverty as the dictate of an unalterable fate: they wish to eradicate it as speedily as possible. But to their dismay they find the gap between the rich nations and the poor nations widening. This growing imbalance can pose a threat to the world order. Thus, we need today an adequate understanding of the sociology of affluence as well as of the sociology of poverty.

The developing societies have a set of special problems ranging from their viability and survival as independent nations to technological transformation and economic progress. Little is known about the social morphology of these countries, except the fact that the fibre of their nationhood is brittle. In their context, therefore, the social sciences have to begin with the natural history function and progressively assume an explanatory role, attempting ascending levels of generalisation. Competing pulls of parochial loyalties pose an important, but *only one*, set of problems distracting them from emerging as cohesive nations. The range and strength of other problems remains to be determined and measured. Planning for economic progress in most of these countries is often reduced to a blind game in the absence of the necessary benchmarks, i.e., concrete social and economic data to provide a realistic base for planning. Without the insights derived from social sciences research many of the dilemmas of development remain unresolved, resulting sometimes in simultaneous encouragement to contrary pulls. The need for scientific understanding of social phenomena, especially the emerging trends is great in these countries but most of them have neither the men nor the money to plan and carry out the necessary investigations. Research by outsiders can help, but the assumptions and motivation behind it are sometimes of questionable legitimacy.

India has all the well identified problems of developing societies; the urgency of creating a cohesive, viable, and durable nation; the need for inducing rapid economic growth; and the pressure for meeting the persistent demand for distributive justice. In more than a quarter of a century of its independence it has gone through a wide range of experience and moods from hope to despair, from fear of disruption to evidence of unanticipated reserves of strength and unity, and from threats of economic collapse to signs of recovery. There is no doubt that it has shown unusual resilience and remarkable adaptive capacity, but it is equally clear that the country is not adequately prepared to cope with many areas of doubt and uncertainty. One has to reckon with the fact that the country attains a strong sense of unity only when it is faced with a major threat of aggression from outside: against the equally serious but internal threats of poverty, population explosion and unemployment it does not find itself so united. Discipline—social, political and economic—tends to be lax and the country finds itself unable to enforce the laudable norms that it thoughtfully evolves. There is often wide divergence between the overt aims of policy and its consequences in practice. It has often failed to anticipate the sands in the wheels of progress. Uniformed by analytical insights, administration and planning go by experience, intuition, and hunches. Of course, in comparison with many developing countries India has a wider range of relatively dependable statistics. Its social morphology is understood in broad outline at least. Also, there are additions of analytically significant studies every year. But all this work does not provide a coherent picture either of the structural base or of the emerging trends. Much of the research has little contemporary relevance. On major questions of the day, when any concern in regard to them has been shown, the research exercises have only scratched the surface. A great deal of research is pursuit of triviality. There is considerable unease in taking up major issues for investigation, in developing appropriate research tools for them, and in making analyses that throw up significant ideas. The potential of social science research to provide understanding on key issues and critical areas remains largely unutilised.

Social Sciences and National Development

Social Science research, let there be no illusion, is not a substitute for national development: in many instances it would not even indicate a clear policy-line. Social scientists are nowhere close to being social engineers, a claim that is sometimes made arrogantly. The power of the social sciences is explanatory, and its practitioners are essentially analysts. Even within this general limitation, they can make a useful contribution to national development.

Six major possibilities of the utilisation of social science research towards national development can be identified. They are:

1. Social science research throws up valuable background data from which the planner can make his own assessment of the prevailing situation, especially of the magnitude, complexity and ramifications of the problem he has to handle.
2. Carefully designed analytical studies can illuminate critical areas of policy. The overt and covert dimensions of a given problem emerging in such studies provide the planner with a measure of foresight to deal with them effectively and efficiently.
3. These studies open up the possibility of testing the validity of the assumptions that must, of necessity, be made by the planner in setting his proximate and ultimate objectives.
4. They enable the planner to estimate the possible consequences and cost of the different choices available to them in determining the path for the attainment of their goals.
5. Diagnostic studies suggest *where* and *why* particular projects go wrong. Their unintended consequences are also brought to light.
6. Wide dissemination of social science research findings increases general awareness in respect of the situation to be met as well as the policy designed for this purpose. This may enhance the credibility of particular policies and prepare the people for them. It may also help towards building up popular pressures for reformulation of particular policies or for weeding them out altogether.

Some or all of these possibilities can be realised provided social research is geared to policy needs and the planner is responsive and sensitive to the research findings.

Pure Versus Applied Research

The relative merits and claims of *pure* and *applied* research have been discussed time and again. This unending debate makes little sense.

My argument is that all good social research is focused on problems, and that all good analyses have a manifest or latent potential of applicability. Some social scientists, let us recognise, preach what John Madge calls the 'philosophy of empty plenty' when they support formulation of knowledge with no concern for doing something with it. The question is not that of pure or applied research, but of tapping studies for possible applications. The leads thrown up by good studies can be operationalised and pursued in applied terms. The so-called applied research is at least

an adjunct to what is commonly called pure research. What matters most is locating the right problems and analysing them in depth and in all their ramifications. Without this applied research is often reduced to the quest of the trite and the trivial.

Theory Building

It is obvious that we need sound theory. But how do we go about it? Shall we start running from nowhere in hot pursuit of theory? Such a blind race would yield perhaps only vacuous and spurious theory. The emphasis on theory building should not imply the undervaluation of data gathering; but to many, in practice, it does. This is unfortunate. Facts are important in themselves, for proving or disproving hypotheses, and for deriving generalisation of theoretical nature at different levels of abstraction. It is not being suggested that social sciences can rest with assembling a great mass of data. The facts have to be arranged in a systematic and coherent manner. One has then to look for interconnections between parts and begin to seek meanings and explanations. This leads to testing of hypotheses and to the emergence of generalisations.

At the present stage of the development of social sciences in India I would attach the highest importance to posing the right questions and to formulating and testing meaningful hypotheses. This would lead, in time, to theory building.

Theory, it can be argued, suggests the need for more facts and new hypotheses. This is not denied. It would do indeed when we begin to evolve theoretical constructs valid for Indian conditions. But do we have many such constructs today? And we should not fail to be cognizant of the tyranny of established concepts. Without wide awake awareness they can set invisible limits to thinking and data gathering.

Creating Nation-wide Debates

I do not know if we have achieved 'the civilization of the dialogue.' It certainly is a worthy ideal, but there is growing evidence of manipulative interference with the much needed dialogue. Subtle and often invisible forces work assiduously to mould opinion. The power of the mass media is tapped to fashion attitudes, and the process starts at a stage when the target is not in a position to resist it. Even thought packages are offered at a premium and are attractively gift-wrapped. What happens to the dialogue? But there is evidence to suggest that thought does not cease, that people resist manipulation if it is carried beyond a point, and that even the most well-greased and efficient thought-control machines fail in their objectives.

Dialogue, I suggest, is better than partisan debates. If it is informed by social science insights, it can generate thought-processes

which may have important implications for the course that the society adopts for itself. The social sciences are not in a position to legislate social change or to go beyond suggesting policy alternatives. Facts must be kept apart from the interpretation of facts. It is not difficult to visualise a situation where different groups of social scientists draw different inferences and conclusions from the same data.

The ideal of objectivity is not outdated, although it is not the same thing as ethical neutrality. Objectivity involves also questioning and evaluating the assumptions implicit in theoretical formulations and research programmes. Ethical neutrality can induce one into playing it safe and even turning away from controversial issues: objectivity makes more exacting demands. Balanced appraisals are a better help to thought than prescriptive arguments. Objectivity does not rule out deep human concerns. It should not.

In India the social scientists have generated some dialogue on matters of major social concern—the holy cow, the intergenerational gap, the practice of untouchability, the problem of minorities, and so forth. The trend deserves encouragement. More and more social scientists should come out and should not hesitate to use the mass media to continue the dialogue. Thereby they will be contributing to the creation of greater awareness of social realities and problems, and will be helping, in the process some serious thinking. The social scientist will have more to contribute to this dialogue when he is equipped with the findings of purposive research on issues of vital social concern.

Social Science Research in India

Earlier I have said a few harsh things about social science research in India. My comments refer to the general scene. Of course, there are some bright patches too and there also is a welcome emergence of hopeful trends. But, by and large, a great deal remains to be done.

Let me briefly restate some of the major weaknesses of social science research in India. Most of it lacks a national focus and is not relevant to the major concerns of the day. In other words, the right questions are not being asked, or, when asked, they are not pursued seriously. There is no evidence of vigorous methodological innovation. There is excessive reliance on concepts established abroad and much uncritical use of borrowed methodology. In point of fact, a substantial part of our better writing is addressed to mentors and peers abroad, whose approval still means more to us than the approval of peers at home. We tend to get worked up on the trivial, and count barren theoretical and methodological exercises as triumphs. In the alternative, we refuse to examine the social reality empirically and begin to seek answers to contemporary questions in ancient texts and traditions. Many of those who

belong to this school end up being commentators, or, an air of unreality about much of the research activity in the country.

There are examples of outstandingly good work, but they invariably have a narrow focus. The ideas emanating from them are rarely subjected to systematic verification in wider areas. Without this a comparative and national perspective does not emerge. Thus, while such studies definitely fill a gap and set a model, it is difficult to generalise from them. Their validity remains to be tested, and there is little evidence of any organised effort to do this.

In the last two decades funds have been made available on an increasing scale to support social science research. There was some efforts also to promote comparable research on selected themes. A considerable volume of data was gathered through these sponsored projects. One hopes that the data was useful in planning. But I do not know of many significant conceptual or methodological gains registered through these projects. Some of them were poorly organised and indifferently executed; the participation of project directors was minimal and most of the work was left to ill-trained investigators. On the positive side, it may be said that government sponsorship did provide an impetus to social science research. But there is a negative side too: it resulted in a great deal of mechanical and some very shoddy work. One wonders how much they have enriched the research tradition.

Several agencies of the government are involved in social science research; some were specifically created for this purpose. Here too one gets a picture of a great deal of mechanical work and of a general sterility in respect of significant ideas. I have an uneasy feeling that these organisations have some built-in devices to distract them from the path of creativity. Take the case of the Anthropological Survey of India. Has the country gained or lost by maintaining this monolith? Are its gains commensurate with what the tax-payer is spending on it? The Registrar-General's Office has carried out several surveys and produced an impressive number of reports. The record of this organisation is certainly one of high productivity, but the scale of its operations is such that it has to sacrifice quality for quantity. Nevertheless, its publications are a rich and invaluable source of social data. Some imaginative programmes were initiated by the National Institute of Community Development and it has been maintaining a steady flow of publications. There is a good case for looking into and correcting the organisational incompatibilities and contradictions in government-run research institutions. Efforts should be made also to draw them into the main academic stream of the country.

Not many universities have adequate funds earmarked for research. The UGC has now offered to each university a grant for development of research. This should help, but the claims on

these funds are so many, and such diverse factors (including non-academic ones) govern their disbursement, that individual scholars or groups cannot be assured continued support even on a modest scale. The number of research scholarships and fellowships has also increased over the years, and it is likely to increase further. This is to be welcomed. But these are often distributed equitably among the different departments and within the department to students on the basis of marks, without any consideration of the quality of the research proposal or of the ability of the scholar to carry it out. What happens to the scholar is worse. Pre-Ph.D. training either does not exist or where it does it is not very effectively organised. The head or the supervisor 'gives a topic' for research to the scholar, who is then left to his own devices. There are notable exceptions, but in general it can be said that research themes are chosen without much imagination and the dissertations are written in a routine and mechanical manner. Not many scholars find the exercise a positive and stimulating experience. It is well-known how Ph.Ds. are given, in many cases, on *quid-pro-quo*.

I do not wish to suggest that we legislate either on the themes of research or on methods. But the academic elite can certainly invest prestige into work on areas that it considers important. Methodological innovation can also be rewarded. Comparative and long-term research can be given special attention. Organisation of research, at different levels, needs to be looked into; management guidance in this field will be a great help.

The function that I visualise for social research is mainly explanatory: under certain conditions it can also be diagnostic. It cannot project a definite course of social action; it can, at best only suggest policy alternatives. The social scientist is nowhere near the realisation of the status and its attendant roles that Comte visualised for him, but let him not lose heart. Even within the limitations under which he must work, he can make a meaningful contribution. That he makes it possible for the policy planner to move from the known towards the desirable but the unknown is a help of major consequence. Towards this end he has to sharpen his tools and define his focus, and approach his task with determination and dedication. In the final analysis we will be judged by the quality of our products and by our success in communicating it to the community in general and to the policy planning in particular.

Growth of Social Sciences in India

B.A.V. Sharma

Social sciences are claimed to be a part of India's heritage. In its modern sense, its history can be traced back to the beginnings of the twentieth century. Among the different social science disciplines, Economics and Political Science were the first to gain recognition as independent or autonomous disciplines. The disciplines of Sociology, Psychology and Anthropology were late comers on the scene and are still in their adolescence. Many social sciences started their careers with the recognition of the status of academic disciplines and thus gained entry into the university system.

It is generally acknowledged that during the colonial period the development of social sciences was retarded. The system of higher education was narrowly conceived and was not conducive to serious academic work in the various branches of social sciences. Social Science studies during this period were narrowly confined to the decennial census surveys started by the British Government in the seventies of the last century and ethnographic studies of Christian Missionaries who did missionary work in tribal areas. Several individuals inspired by spirit of nationalism like Dadabai Naoroji, R.C. Dutt, M.G. Ranade and G.K. Gokhale did pioneering work in the field of social science research. In general the stunted growth of social sciences during the colonial era could be attributed mainly to the fact that not many Indian universities offered facilities for doctoral work. The dawn of independence and the expansion of the university system have stimulated the growth of social science in India after 1947.

The magnitude of social science enterprise in India can be assessed by a number of indicators.

1. Universities

In 1947 there were 20 universities and by 1975-76, there were 101 universities indicating a five-fold expansion. Along with the universities there has been corresponding increase in the number of affiliated colleges (See Table-1).

2. University Departments

In the Indian university system the post-graduate departments of social sciences in universities and affiliated colleges have the

major responsibility for teaching and research in social sciences. In 1970-71, for which detailed information are available, there were 91 universities with 823 post-graduate departments in social science subjects; 397 located in universities and 426 in colleges affiliated to the universities (See Table-2).

3. Research Institutions

Besides universities and colleges there are a number of research institutions mainly devoted to social science research. Some of them are affiliated to universities and others are outside the university system. A survey of research institutions undertaken by ICSSR indicates that in 1971 there were 95 research institutions which operated outside the university system. They were either wholly government institutions (18) or autonomous but entirely financed by government or wholly independent without any government support (16).

Table-3 presents the distribution of research institutions according to their field of specialisation:

Social Science Research is not the monopoly of universities and research institutions. The Central and State Governments also carry on research which are policy-oriented. R and D (Research and Development) wing is increasingly becoming an essential part of every governmental organisation. The fields in which there has been noticeable contributions by governmental institutions include Anthropology, Agricultural Economics, Population Studies, Criminology, Economic Planning, etc.

A new trend which is gaining momentum is the incorporation of social science content in the technical and professional curricula like Agriculture, Engineering and Medicine. Departments of Social Sciences and Humanities are making their appearances in the Institutes of Technology, Engineering colleges, etc.

4. Doctorates in Social Sciences

Development of social science research is linked with research work leading to M. Phil./M. Litt., Ph.D. and D. Litt., degrees. All the universities have programmes for students and teachers to register for research and award degree based on dissertation work. Since all the Indian universities award Ph.D. degree, an estimate of number of Ph.Ds. awarded would be a good index of volume of research in various social science disciplines (See Table-4).

5. RPC, UGC and ICSSR

Prior to independence the development of social science research was inexorably linked with the growth of Indian universities and

research institutions, many of which were privately founded. Government did not play any direct or active role in the propagation of social science research. The establishment of the Planning Commission in 1950 gave the impetus for the involvement of government in social science research.

a. *Research Programmes Committee*: The Planning Commission after its creation realised the need for social science research on topics of relevance and significance to national development. In 1953, the Research Programmes Committee (RPC) of the Planning Commission was established to work out and administer suitable schemes of research investigation into social, economic and administrative problems relating to national development, in consultation with universities and other institutions. The First Five Year Plan provided a sum of Rs. 50 lakhs to promote these objectives. During the period 1953-69 the RPC financed about 400 research studies on various socio-economic problems having a bearing on Planning process. With the establishment of Indian Council of Social Science Research (ICSSR) 45 on-going research projects of RPC were transferred to ICSSR and RPC's role was confined to problems having a direct bearing on Plan formulation and implementation.

b. *University Grants Commission (UGC)*: During the year 1963-64 the University Grants Commission (UGC) initiated a scheme of financial assistance to university/college teachers for undertaking short-term/minor research projects in humanities and social sciences with a view to enabling individual teachers and in particular college teachers and young lecturers in the universities to engage themselves in research work. The scheme is intended to provide facilities which would help in the initiation of a research project and provide minimal support by way of books, field work, etc. to those members of the teaching community in the universities who have aptitude for research but do not have the resources to pursue research.

A UGC Committee which reviewed this scheme has noted that 4,177 teachers in humanities and social sciences were benefited under this scheme during the period 1963-64 to 1978-79. Of the teachers benefited, nearly two-thirds of the total number are college lecturers and one-third young teachers from the university departments. The average expenditure per teacher has been Rs. 2,737 (See Table-5).

Since the year 1975-76, the UGC has been implementing the Teacher Fellowship Scheme. Teacher Fellowships are meant for teachers from affiliated colleges offering instruction in social sciences. Teacher fellowships are specially meant to provide opportunities for teachers to work towards either M.Phil. or a Ph.D. degree. The Commission has so far awarded more than 5,000 fellowships (besides social sciences it includes humanities and sciences) and of these 3,000 have joined the Teacher Fellowship Scheme. Further, colleges receiving development grants from the

Commission can utilise at least 1/6th of the grant for Teacher Fellowships.

The U C has a scheme of award of scholarships and fellowships for the development of research in universities and colleges. In addition to the fellowship specially created for Centres of Advanced Study and departments selected for special assistance, the UGC awards annually senior and junior research fellowships in social sciences on an all-India basis. In 1969-70, the Commission awarded 54 senior fellowships and 179 research fellowships in the humanities, social sciences and science subjects. In 1977-78, it was increased to 100 senior research fellowships and 325 junior research fellowships in humanities, social sciences and science subjects. This is in addition to 2,512 Junior Research Fellowships assigned to the universities, 50 junior and senior research fellowships for scheduled castes and scheduled tribe students, and 60 research fellowship students of border hill areas.

c. *Indian Council of Social Science Research (ICSSR)*: The Planning Commission in August 1965 set up a Committee on Social Science Research under the chairmanship of Professor V.K.R.V. Rao. The Committee which submitted its report in 1967, recommended the establishment of an Indian Council of Social Science Research for promoting research in social sciences. The ICSSR was set up by the Government of India on 15 April 1969.

Among the programmes and activities of ICSSR, the promotion of research occupies a central place. The research programme includes:

- (i) financial support to research proposals received from social scientists and institutes,
- (ii) fellowships,
- (iii) out of the total budget of Rs. 161.83 lakhs in 1976-77, Rs. 31.20 lakhs (19.28 per cent) was spent on Research Grants, Rs. 16.48 lakhs (10.18 per cent) on research fellowships and Rs. 54.13 lakhs (33.57 per cent) on research institutions. These three activities accounted for nearly two-thirds of the budget of the ICSSR.

The *research project* is the most extensively used instrument of the ICSSR. A total of 708 research projects were sanctioned between 1969-70 and 1976-77 (See Table-6). A classification by discipline (See Table-7) indicates that two-third of all approved proposals belong to the three major social science disciplines viz. Economics, Political Science and Sociology and between these three they are nearly equally divided. When classified according to the status of Project Directors (See Table-8) almost 600 out of the 708 approved projects were in the charge of faculty members of university departments and research institutions and only half of

the balance were in charge of the teachers working in affiliated colleges. In terms of geographical distribution (See Table-9) almost one-fourth of the approved projects were located in the union territory of Delhi and out of this as many as 48 projects were located in the Jawaharlal Nehru University and another 39 in the Delhi University.

The ICSSR *Fellowship Programme* includes (a) National Fellowships, (b) Senior Fellowships, (c) Fellowships for young Social Scientists, (d) Post-Doctoral Fellowships, and (e) Doctoral Fellowships and other forms of assistance to doctoral students. The scheme of National Fellowships was initiated in 1970-71 to invite outstanding social scientists to work on some important problems of research. Generally, the number of such fellowships at any given time is restricted to six. Since its inception only 10 awards have been given which works out to just about one per year.

The *Senior Fellowship* was instituted for senior Indian social scientists to enable them to undertake whole time research by buying their time from other responsibilities. Over the first 8 years of ICSSR's working, 44 senior fellowships were awarded.

The *Doctoral Fellowships* have been one of the major programmes of ICSSR and thus one of the major items of its expenditure. During the period 1971-72 to 1976-77 the ICSSR awarded 401 doctoral fellowships of which 323 were accepted (See Tables-10 and 11). In terms of academic disciplines, Economics, Political Science and Sociology received more number of doctoral fellowships when compared to other social science disciplines. In terms of geographical distribution, once again there was excessive concentration in Delhi.

While development of the institutional base for social science research is mainly the responsibility of the university system, the need for a few research institutes in social sciences outside the university system has been recognised. In 1975-76, the ICSSR supported 15 research institutes and set apart a sum of Rs. 50.58 lakhs for this purpose.

The Second Review Committee (1978) has expressed the view that the establishment of the ICSSR is "clearly one of the important landmarks in the development of social science in India. Its work in the past nine years has fully justified its establishment. It has made a significant contribution to the development of social research in the country."

Social Science Manpower: Since most of the social science research is undertaken by the social scientists in the universities and colleges an idea of their number would be of great significance. According to UGC in 1969-70, the number of social science teachers employed in university departments were 2,582 who were distributed among the various social science disciplines (See Table-12).

The social scientists who are working on the affiliated colleges which were 3,112 in 1969-70, also constitute a large reservoir of social science manpower (approximately 7,000). In addition, it has been estimated that there are 772 social scientists employed in 399 technical and professional institutes. According to one estimate, there may be 10 to 12 thousand social scientists in teaching and research institutions in India.

Another potential source of social science manpower are the students enrolled in post-graduate courses in social sciences and candidates registered for the Ph.D. In 1969-70, 42,479 students were enrolled in post-graduate courses, and 2,153 had registered for Ph.D. courses.

Professional Associations: According to ICSSR, 1971 there were 60 professional associations in the country, of which 33 are all-India and 27 regional. The earliest professional organisation was in the field of History (1919), followed by Anthropology (1921), Geography (1926), Linguistics (1928) and Economics (1929). There has been gradual increase in the number of professional associations since independence (in 1947 it was 16, rose in 1951-59 to 25, in 1967 to 47 and in 1970 to 60). The largest number of associations was in the field of Geography (10), followed by Anthropology (8), Economics (7) and Political Science (7).

Social Science Journals: It has been rightly remarked that "as a discipline grows, the volume of research grows, and the need for more journals to publish the research findings alongside becomes increasingly felt. Thus the number of research journals in a discipline is one indicator of its status and growth." According to an ICSSR Survey there were 863 social science journals in 1973 (See Table-13). The volume of publications in the field of social sciences has been steadily increasing (See Table-14). It has been noted that during the 40-year period (1925-65) the total number of research publications were 16,729, which works out to an average of 418 per year.

Financing of Research: Social Science Research is carried on mainly in universities and colleges. However, research in universities for very long time were meagrely subsidised. Research scholars had to find their own means of financing their research work. In more recent years, the UGC and ICSSR have come in a big way to provide institutional support to social science research. Among the foreign agencies the USEFI and Ford Foundation and Rockefeller Foundation have been providing some financial assistance for social research. Among the indigenous private foundations mention may be made of Tatas, Birlas and other industrial and business families and companies. The government is the main funding agency for social science research. In the distribution of funds for research, however, social sciences are given a low priority. In 1973 it was said that "India spends about

Rs. 2,500 millions per year on research and development in the natural, technological, agricultural and medical sciences and around Rs. 25 millions on research in the social sciences," i.e. only one-hundredth of natural sciences.

Conclusion: The role of social sciences in socio-economic and politico-administrative development of the country is being increasingly recognised. Besides the government, public and private Sectors are promoting and furthering research in social sciences. The fact that social science research can contribute to the prosperity of the country has been gaining ground. In the transformation of India into a socialist, secular and democratic society, therefore, social sciences have become an essential input.

TABLE 1

**Educational Statistics in India
(1965-66 and 1975-76)**

	1965-66	1975-76
I. Number of educational institution by type		
1. Universities	64	101
2. Institutions deemed as universities	8	9
3. Institutions of national importance	8	9
4. Boards	28	43
5. Research institutions	39	47
6. Colleges for general education (P.G. degree and undergraduate standard)	1,673	3,667
7. Colleges for professional education (P.G. degree and undergraduate standard)	2,775	3,276
8. Colleges for other education (P.G. degree and undergraduate standard)	1,253	1,405
II. Number of pupils by stages of instruction		
1. College standard	6,851	13,898
2. Postgraduate (M.A./M.Sc. and Diploma)	71,821	180,257
3. Graduate (B.A./B.Sc.)	625,907	1,408,744 554,473
4. Pre-University/Intermediate	623,642	950,356
5. Undergraduate Diplomas	2,970	5,350
III. Number of teachers		
1. Universities/deemed to be univer- sities/institutions of national importance	9,271	18,981
2. Research institutions	389	815
3. Colleges for general education	58,057	128,082
4. Colleges for professional education	53,972	78,954
5. Colleges for other education	6,675	8,990

TABLE 2

**Social Science Post-Graduate Departments in Universities
and Colleges: 1970-71**

<i>Discipline</i>	<i>University Departments</i>	<i>Departments in Affiliated Colleges</i>	<i>Total</i>
Anthropology	18	1	19
Commerce	56	92	148
Economics	72	149	221
Geography	48	40	88
International Relations	2	—	2
Linguistics	15	—	15
Management	4	—	4
Political Science	59	80	139
Psychology	46	19	65
Public Administration	19	4	23
Social Work	7	7	14
Sociology	51	34	85
Total	397	426	823

Source: *University Development in India: Basic Facts and Figures: 1969-70*, University Grants Commission, March 1973.

TABLE 3

Research Institutions according to Specialisation

<i>Social Science Specialisation</i>	<i>Total</i>
Anthropology	10
Commerce, Demography and Economics	30
Management	13
Political Science and International Relations	7
Psychology	3
Public Administration	4
Sociology	8
Total	98

Source: *Directory of Social Science Research Institutions in India, 1971*, ICSSR Publication, Number 30.

TABLE 4

Ph.Ds. in Different Decades

<i>Subject Cluster</i>	<i>1911- 20</i>	<i>1921- 30</i>	<i>1931- 40</i>	<i>1941- 50</i>	<i>1951- 60</i>	<i>1961- 70</i>	<i>1971</i>	<i>Total</i>
Economics, Commerce and Demography	2	4	15	69	323	836	127	1376
Political Science, International Relations and Public Adminis- tration	1	—	1	9	102	414	83	810
Sociology, Social Anthropology, Social Work and Criminology	—	—	4	34	79	323	43	483
Psychology	—	—	—	3	51	262	32	348
Human Geography	—	—	—	4	27	125	30	186
Management	—	—	—	2	2	32	5	41
Total	3	4	20	121	584	1992	320	3044

TABLE 5

**UGC Financial Assistance to University/College Teachers
for Short-term/Minor Research Work in Humanities,
Social Sciences and Sciences (1963-64 to 1978-79)**

<i>Year of Award</i>	<i>No. of Awards in Humanities and Social Sciences</i>	<i>Total Amount Sanctioned/ Approved for Humanities and Social Sciences (Rs.)</i>
1963-64	16	33,500
1964-65	123	85,663
1965-66	235	1,34,774
1966-67	174	1,11,405
1967-68	175	1,25,464
1968-69	255	1,38,520
1969-70	180	1,65,918
1970-71	233	1,51,325
1971-72	213	1,60,725
1972-73	757	4,22,589
1973-74	277	2,26,455
1974-75	288	4,88,650
1975-76	297	7,59,767
1976-77	231	6,01,465
1977-78	312	8,56,300
1978-79	461	12,79,135

Source: *Report of the Review Committee on UGC Programmes, UGC, 1981.*

TABLE 6

**Number of Applications Received from Year to Year and
the Number Sanctioned during 1969-1977 by ICSSR**

Year	<i>Total No. of Research Proposals</i>	
	<i>Received</i>	<i>Sanctioned</i>
Projects transferred from the Planning Commission	—	45
1969-70	155	13
1970-71	300	74
1971-72	415	103
1972-73	320	104
1973-74	261	88
1974-75	236	69
1975-76	304	105
1976-77	314	107
Total	2,305	708

N.B.—(1) Some of the research proposals received in a given year cannot often be sanctioned in that year. These are then carried over to the next year.

(2) The sanctioned research proposals include, not only the proposals sanctioned as responses to applications received but also the sponsored research proposals.

S.C.E.R.T., West Bengal

Date 10-3-87

Acc. No. 3853



001
SHA

TABLE 7

Research Proposals Approved by ICSSR

<i>Discipline</i>	<i>Number</i>	<i>Per cent to Total</i>
Anthropology	32	4.52
Commerce	15	2.12
Demography	7	0.99
Economics	181	25.56
Education	21	2.97
Geography	20	2.82
History	14	1.98
Linguistics	4	0.56
Management	6	0.85
Political Science	152	21.47
Psychology	61	8.61
Public Administration	29	4.10
Sociology	142	20.06
Social Work	7	0.99
Law	9	1.27
Others	8	1.13
Total	708	100.00

TABLE 8

Research Proposals Approved by ICSSR by Status of Project Directors

<i>Status of Project Directors</i>	<i>Number</i>	<i>Per cent to Total</i>
University Departments and Research Institutes		
Professors	292	41.24
Readers	157	22.18
Lecturers	145	20.48
College Teachers	56	7.91
Others	58	8.19
Total	708	100.00

TABLE 9

**Research Proposals Approved by ICSSR by States and
Union Territories**

<i>States/Union Territories</i>	<i>Number</i>	<i>Per cent to total</i>
Andhra Pradesh	37	5.23
Assam	7	0.99
Bihar	46	6.50
Gujarat	51	7.20
Kerala	13	1.84
Madhya Pradesh	17	2.40
Tamil Nadu	24	3.38
Maharashtra	76	10.73
Karnataka	21	2.97
Orissa	10	1.41
Punjab	6	0.85
Rajasthan	48	6.78
Uttar Pradesh	80	11.30
West Bengal	60	8.47
Haryana	12	1.70
Himachal Pradesh	7	0.99
Jammu and Kashmir	7	0.99
Delhi	165	23.31
Chandigarh	11	1.55
Manipur	2	0.28
Nagaland	1	0.14
Other Areas	7	0.99
Total	708	100.00

TABLE 10

Distribution of ICSSR Doctoral Fellowships by Disciplines

<i>Subjects</i>	<i>Number of fellowships</i>	<i>Per cent to total</i>
Anthropology/Social Anthropology	16	4.9
Economics	85	26.3
Education	11	3.4
Geography	32	9.9
History	6	1.9
International Relations/Politics	14	4.3
Linguistics	5	1.5
Political Science	59	18.3
Psychology	30	9.3
Public Administration	9	2.8
Sociology	47	14.6
Others (Law, Commerce, Criminology, Defence Studies, Demography, Engineering, Social Work)	9	2.8
Total	323	100.0

TABLE 11

**Distribution of ICSSR Doctoral Fellowships by States,
Union Territory Etc.**

<i>State</i>	<i>Number of fellowships</i>	<i>Per cent to total</i>
Andhra Pradesh	18	5.6
Assam	4	1.2
Bihar	10	3.1
Delhi	158	48.9
Gujarat	8	2.5
Haryana	1	0.3
Himachal Pradesh	1	0.3
Kerala	7	2.2
Karnataka	10	3.1
Maharashtra	15	4.6
Madhya Pradesh	16	5.0
Orissa	4	1.2
Punjab	9	2.8
Rajasthan	12	3.7
Tamil Nadu	3	0.9
Uttar Pradesh	35	10.8
West Bengal	5	1.5
Foreign Universities	3	0.9
No Information	4	1.2
Total	323	100.0

TABLE 12
Social Science Teachers in University Department

	<i>Discipline</i>	<i>Number</i>
1.	Anthropology	119
2.	Economics	698
3.	Geography	295
4.	Home Science	226
5.	Linguistics	71
6.	Political Science	491
7.	Psychology	258
8.	Public Administration	53
9.	Social Work	88
10.	Sociology	243
	Total	2582

TABLE 13
Social Science Journals in India (1973)

<i>Discipline</i>	<i>Number</i>
Anthropology	17
Business Management	32
Commerce	70
Economics	242
Education	96
Folklore	1
Geography	35
History	25
Law	68
Linguistics	8
Political Science	45
Psychology	11
Public Administration	30
Social Sciences	35
Sociology	37
Social Work	38
Statistics	28
Town and Country Planning	6
Transportation	39
Total	863

Source: Yogesh Atal, *Social Sciences The Indian Scene*, New Delhi, 1976,

TABLE 14
Behavioural Science Research in India
(Between 1925 and 1968)

S. No.	Field	No. of Publications		Total
		1925-65	1966-68	
1.	General	126	56	182
2.	Research Methodology	282	181	463
3.	Theory and Development	370	294	664
4.	Experimental Study of Behaviour	766	454	1,220
5.	Individual Development	420	205	625
6.	Social Structure	266	161	427
7.	Pluralities	1,162	569	1,731
8.	Social Dynamics	1,055	634	1,689
9.	Culture	1,431	297	1,728
10.	Individual Dynamics in Culture	1,579	491	2,070
11.	Personality and Abilities	2,554	796	3,350
12.	Social Pathology	569	113	682
13.	Behavioural Disorder	469	150	619
14.	Guidance and Therapy	147	90	237
15.	Industrial Behaviour	771	176	947
16.	Administrative Behaviour	301	216	517
17.	Social Work and Survey	2,368	234	2,602
18.	Education in various stages	394	331	725
19.	Education in various groups	276	139	415
20.	Curriculum	461	159	620
21.	Teaching of subjects	755	314	1,069
22.	Training	207	208	415
Total		16,729	6,268	23,097

Source: Pareek, Udai: *Directory of Indian Behavioural Science Research*; Delhi, Acharan Sahkar, 1971.

Traditional Methods—I

K. Raghavendra Rao

A very fundamental question is whether we can at all meaningfully divide the methods of social research into the "traditional" and the "non-traditional." In that case, we shall have to demarcate what is "traditional" method from what is not. Then, would it be appropriate to call the latter, "modern"? What is an even more controversial and contentious issue in the field of social epistemology and scientific epistemology today is would it be right to call it "scientific" by equating what is modern with what is scientific? The most simplistic and commonly accepted view is that the study of society had a dark historical past in which certain "traditional" methods prevailed, and then subsequently it turned "scientific," giving birth to a number of social sciences, at any rate, in the West, and that, thereafter, social research became "scientific" displacing the "traditional" methods. Now, this view is not wrong or false in any straight sense, but it is certainly partial and incomplete as an historical account of the development of the "modern" social sciences. Let us first ask: What are the traditional methods in social sciences? We can answer this question by referring to the methods employed in understanding the economic, sociological and political aspects of society, prior to the birth of the modern social science disciplines of Economics, Sociology, and Political Science.

The study of politics, economics and social system, has a long tradition in the West, going back at least to the ancient Greeks. In other words, it has a tradition which is more than two thousand years long. Presumably, the methods used in this tradition were "traditional". But to locate the cutoff point of the mergence of "non-traditional" methods of social research, we need to locate the terminal point or points of this tradition. First, let us take a look at Economics, for, in many ways, it is claimed to be the most "scientific" among the social sciences. Taking economics as a discipline to be the social science that deals with the ways in which men and societies seek to satisfy their material needs and desires, since the means at their disposal do not permit them to do so completely, it has been suggested by relevant historians that the modern discipline of Economics arose as Political Economy in the eighteenth century in Europe, with the physiocrats providing the pioneer group in this development. Marx,

who was as much a great student of the classical phase of Economics as its greatest critic, believed that Political Economy, that is, the new science of Economics arose historically, not only for the scientific purpose of studying Economics but, for the quite non-scientific as well of justifying a certain economic arrangement, the emerging industrial capitalism. In short, we find Marx challenging the scientific status of the new social science of Political Economy. Therefore, even as a science, Economics has a considerably long tradition. If this is so, then it can be denied that it acquired its present scientific rigour and status over a long period of gradual development. Hence, the simple dichotomy of the traditional and scientific methods may not suffice in understanding it historically or substantively. We shall have to produce a more sophisticated taxonomy, and identify three, not two, methodological approaches in Economics namely, the pre-scientific or traditional non-scientific, the proto-scientific or scientific traditional, and the "modern" scientific.

If we assume sociology to be "the study of social aggregates and groups in their institutional organization, of institutions and their organizations, and of the causes and consequences of changes in institutions and social organization" then historians have located its birth in mid-nineteenth century in Europe, crediting the Frenchman Auguste Comte, as its founding father. The history of sociology differs from that of Economics, both with regard to its relatively later historical emergence and its inability to acquire a comparable "scientific" respectability. Unlike in economics, we find that sociology contains deep divisions in terms of methodological commitment and practice. There are conflicts between tradition represented by Sorokin in the USA or Radhakamal Mukherji in India, which is supposed to be either non-scientific or not fully scientific or normative, and the tradition represented by the till recently dominant quantitative-scientific approach. Now sociology presents a somewhat complex methodological picture, with the "scientific" model assailed by ethno-sociology and phenomenological sociology. Some of the latter are certainly not "modern" and could be more appropriately termed "traditional". In short, in the field of sociology, there is clear situation of co-existence between the "traditional" and the "scientific".

Though the study of politics antedates either economics or sociological investigation, in the West, the modern social science discipline of Political Science was born even later than Sociology towards the end of the nineteenth century. In every important respect it presents a far more confusing and unsettled methodological picture than the one presented by either Economics or Sociology. Indeed, the history of this social science has been the most devious, and current Political Science betrays the impact of this jagged and tortuous history. One of the innovators in modern Political Science, David Easton has quite succinctly summed up this state of affairs as follows: "During the many centuries from classical antiquity almost

to the end of the nineteenth century, the study of political life remained not a discipline in the strict sense but a congeries of inherited interests. Only in retrospect, when modern criteria are imposed upon the thought of the past social philosophers, is it possible to identify their intellectual concerns as indeed part of what today we choose to call political science. As a result, by the time political science took shape as an independent academic discipline, it had assumed a thoroughly synthetic character..." A clear symptom of the unsettledness of Political Science is its inability to crystallise its terrain of study and concern. Even its academic title is in dispute. Excepting in the USA where its title is universally Political Science, in the UK and even in India, it is differently known as Politics, Political Science, Political Study and Political Studies. Its subject-matter has been a continuously contested and variable. For a long time, it was believed to be concerned with two central themes—governmental institutions and the state. While the former led to the study of formal and legal institution of the government, the latter led to a philosophical metaphysical speculation. The former approach as represented by the German and continental legal-formalism and the American institutionalism, the latter embroiled the study in philosophical speculation. Both these came to be challenged by the realistic perspective in the early part of this century, resulting in a focus on the study of the processes underlying formal legal institutions. One thinks in this connection about the efforts of Graham Wallas, somewhat prematurely, to develop a science of politics, and the work of the American pioneers—Bentley, in particular, who shifted the focus to the political process which involved a complex interplay of conflict and cooperation between a variety of interest groups in society. It culminated in the liberal pluralism of David Truman. Soon after the end of the Second World War, and largely as a result of the work in American Political Science, the discipline found itself pushed into a precariously scientific situation. With Easton's concept of the political system which became soon central to the scientific, behavioural revolution which primarily aimed to reduce the study of politics to an empirical, quantitative study, whose fundamental postulate in methodology was a sharp separation between value and fact. This positivistic turn led to the concept of political behaviour as an empirical-theoretical construct, severely divorced from such normative phenomena as value and purpose. In the context of this complicated history, Political Science has proved to be the most bitter battleground for the methodological opponents—the traditional normative and the behavioural scientific. Only the Marxists had the methodological potentiality to overcome this positivistic dilemma through their dialectical methodology. Unfortunately, and for obvious reasons, they could never make an impact on the formal non-Marxist discipline of Political Science, which continues to be American dominated. Against this background, the divorce between the traditional and the scientific methods has been the most radical in the social sciences.

Eliminating historical angularities and specifications, we may conclude that the traditional and the non-traditional methods in social research, may be distinguished in terms of pre-scientific/non-scientific/anti-scientific and the scientific. But formulation rests methodologically and philosophically on a particular conception of science and scientific method. Reducing a vast and complex practice with a long historical tradition, to a simplified pattern, we shall briefly discuss as to what the traditional methods are?

The first and foremost characteristic of the traditional is that it is not systematic and consistent. In other words, it has no distinctive method or methods as such. It is dominated by a kind of *methodological ad hocism*. The essence of the non-traditional method is that it is a coherent and distinctive structure. We shall take two political students from the ancient period, two from the medieval and two from the pre-scientific modern periods, to illustrate the point. First, take Plato and Aristotle. How do these great students of political life go about their task of understanding, formulating and explaining politics? Plato's idealistic methodology makes him strictly independent of empirical facts. At the same time, it cannot be said that he ignores empirical facts. How can he? But the point is that he fails to relate the empirical and the non-factual into a consistently structured method. He should have, but he does not produce a hierarchical epistemology in which non-facts come higher than facts, but what he does is to offer an epistemology in which facts and non-facts are left to remain separated totally. If we look at Aristotle, we find the situation certainly much better but methodologically equally problematic. Unlike Plato, Aristotle uses "facts" more frequently to explain his political propositions, but, he, too, remains unsystematic. Though both Plato and Aristotle appear to be unsystematic in their methods, there is an important distinction between the two. While Plato uses facts to support sometimes, but not always, his theories or propositions, Aristotle occasionally, but not always and consistently, uses facts to question, criticise and modify theories. For instance, he criticised Plato's ideal state on the ground that it did not proceed from known facts. In other words, Aristotle's method contains a non-traditional, scientific element. But he is not consistently scientific. To be scientific is to be consistently scientific, because once we accept a scientific methodology we cannot discard it arbitrarily. Thus, the traditional method is scientific only partially and in fragments.

The second characteristics of the traditional method as employed by Aristotle is that even facts are considered, they are collected unsystematically in an impressionistic and subjective manner. This leads to the subjectivistic feature of the traditional method. The facts cannot be tested or attested by any independent or third party witness. Its authenticity derives from the credibility of a single observer.

The third characteristic, also observable in the case of Plato and Aristotle, is that their method does not make any strict or systematic

distinction between facts and values or empirical data and ethical prescriptions. In the traditional language of philosophy, the traditional method fails to draw any distinction between what is and what ought to be. This distinction is central to the positivistic conception of modern science and its methodology.

The fourth feature of traditional method, also exemplified by Plato and Aristotle is, it is predominantly qualitative as against the predominantly quantitative framework of modern scientific method.

The fifth feature is that it relies more on individual intuition than on patient observation of facts. Another way of formulating this characteristic is to say that the traditional method uses to a much larger extent than the modern scientific methodology, the faculty that may be called imagination.

The five features enumerated above—(1) methodological *ad hocism*, (2) dominance of subjective perception, (3) ethical preoccupation rooted in the refusal to distinguish methodologically between facts and values, between "is" and "ought", (4) the dominance of quality as against quantity, and (5) the greater use of institution and imagination, which are regarded as essentially disruptive of modern scientific methodology, are the constituents of the traditional method.

If we take to medieval theorists of politics, St. Augustine and St. Thomas Aquinas, we find that these five features again characterise their method of study. But the interrelationship between the five features is not the same, not only as between schools of thought, but also as between individuals within the same school. While Augustine and Aquinas differ in the sense that the latter is more sensitive to facts, and hence more realistic than the former. It is also true that they are methodologically united in upholding the Christian framework, which locates man's essence both within and beyond the nature of man. Hence, its ethical preoccupation becomes central.

If we take two early modern political theorists like Hobbes and Rousseau, we find that secular and the empirical play a greater role. Yet, it is important to remember that Rousseau's ethical concern is fundamental, and that Hobbes claimed to be following the methodology of geometry as well as self-introspection. Rousseau was close to the classical Greek method of ethical and intuitive understanding. Even if we include in our discussion Locke, we find that his method of political study is rational-metaphysical rather than empirical-scientific.

After having discussed the traditional methods, the question that arises is what has one to do with this method or these methods. In the hard and straight physical and natural sciences, the answer has been settled against the traditional, subjective, intuitive,

qualitative metaphysical methodology. But in the case of the social sciences, the matter is not so simple. Since man, the subject of our study, is not only the observed, but is also the observer, the positivistic conception of science which excludes the subjective, normative elements, may not be quite appropriate. This has been brought into sharp focus in the problems raised by the positivistic revolution known as the behavioural in the social sciences. The limitations of a mechanical adoption of non-human scientific methods in the study of man and his behaviour were well brought out by the failure of that revolution. In sociology, no less a master of the subject than Max Weber wrestled with the issue of subjective understanding. But his solution ultimately is no solution since it merely separates the knowing from the known object. The traditional methods will be relevant to the social sciences but only in the context of a conception of science broader than the positivistic notion of a purely empirical science, the Marxist conception of social sciences as epistemological structures whose subject is an interpenetration of the subjective and the objective, consciousness and material conditions. The crisis in modern social sciences cannot be solved without some version of the rich Marxist methodological heritage—the reservoir of ideas in Marx and Engels themselves, other early Marxists like Luxemburg, Lehin, Mao-tse Tung, and the new crop of Western Marxists. In this reformulation of methodology, the traditional methods may get a new lease.

Traditional Methods—II

K. Ilaiyah

The twentieth century has made a mark, along with other fields, in the field of social science research too. The field of social research, as it is acknowledged by many methodologists, has to advance as the social relations in a given society become increasingly complex. As society advances, the social research should also advance to dissect the complex society and make others understand as to how it functions. Hence before attempting to know the modern methods of social research one has to understand as to what are the traditional research methods which form the 'base' of the modern social research.

The 'Research Methodology' can be divided broadly into two: (1) Traditional or Pre-Scientific Methods, (2) Scientific Methods. No doubt, it is difficult to divide research methods into compartments like traditional and scientific. However, since the division of research methods into traditional and scientific has been generally accepted by methodologists, here we shall examine as to what these traditional methods are, and what is the role of each method in analysing the socio-economic and political phenomenon of a given society at a given point of time. Broadly, traditional methods are divided into four, viz., (1) Philosophical, (2) Institutional, (3) Legal, and (4) Historical.

Philosophical Method

Philosophical method is the oldest of all the methods. It is through application of this method that people have been understanding human society. Secondly, philosophical approach is not a narrowly focused one. Instead it takes an overall view of human development but draws metaphysical conclusions.

Defining philosophy, indeed, is a difficult task. However, a few definitions are in order. According to American College Dictionary, "philosophy is the study or science of truths or principles underlying all knowledge and being". According to E.G. Moore, philosophy is a general description of the whole universe. In other words, he says "to give a general description of the whole of the universe.

mentioning all the most important kinds of things which we know to be in it, considering how far it is likely that these are in it important kinds of things which we do not absolutely know which to be in it, and also considering the most important ways in these various kinds of things are related to one another."

This general description of the universe depends on the common sense of the philosopher. That is to say understanding the universe based on common sense of an individual and generalise that understanding into broad principles.

There are many people in the world who think that there are many things in the universe which go against the common sense. And common sense is so subjective that it makes a man blind to the reality. For example, many believe that there certainly is God. According to them besides material objectives there exists a 'Divine Mind'. Therefore, they argue that any description of the universe involves the 'Divine Mind' and its role in the process of the universe.

Further, the same category of people believe that there is 'Future Life' beyond one's death. Because for them, the present life has followed the previous one depending on the activities performed by the individual. The Hindu philosophy believes that there is 'PUNARJANMA' based on *Karma Siddhanta*.

On the other hand there are others who think that whatever we see is real and that real is material. They believe in the materialistic existence of the universe. And the progress of the universe depends on the progressive contradictions in the materialistic beings, but not on 'Divine Mind'. Some philosophers argue that questions regarding God, Future Life, Matter, Mind, Space and Time are part of philosophy which may be called 'Metaphysics'.

There is another department of philosophy called 'Logic'. This is concerned with questions like how do you know that? When did you know that? In what does this event consist? etc.

Another department of philosophy is called Ethics. This mentions a set of different questions. For example, would such and such result be a good thing to bring about? Or would it be a bad thing? Would such and such an action be a right action to perform, or would it be a wrong one. Ethical Philosophy is concerned with normative considerations and value judgements. But the fact is all these schools of thinking deal with subjective factors rather than objective factors based on socially observable facts. Therefore, it may be said that the philosophical method is more an intuitive one rather than deductive or inductive. Another department of philosophy which recently acquired importance is the Department of ideology. Ideologies deal with questions like who will be the rulers? How to select the rulers? By what principles will they govern? etc. This is a very important aspect of philosophy. In recent times

ideology has come to explain the role of the political parties in relation to economic development of a nation. Therefore, ideology in a given political system forms the fabric of a social structure.

However, discussing about the weakness of philosophical method in terms of its 'idealism' Plekhnov says, "we have seen that the great German idealists did not succeed in understanding the real nature of discovering the real basis of social relations. They saw in social development a necessary process, conforming to law, and in this respect they were quite right. But when it was a question of the prime mover of historical development, they turned to the Absolute Idea, the qualities of which were to give the ultimate and most profound explanation of that process. This constituted the weak side of the idealising. Therefore the basic weakness of philosophy as a method in understanding the human relations is that, ultimately at one point or other it results in idealism." Let us take for example political philosophers like Plato, Aristotle, Machiavelli, Hobbes, Locke, etc. Platonic Republic takes a partisan view of the world and tries to achieve a society which is the cradle of philosopher kings. Though Aristotle opposes his Master Plato, he wants to have a society based on discrimination by justifying slavery. Machiavelli argues in favour of aggrandisement without looking at the real 'Human Nature'. Hobbes tries to justify the monarchy by philosophising in terms of Absolute Sovereignty. So also Locke justifies private property without realising its exploitative nature. Therefore, mere philosophising the subjective views of individuals, without taking the historical and socio-political facts into consideration, does not lead the Social Scientist anywhere. Conversely it will blind the person to the social reality.

However, philosophy as a method of social enquiry should be understood in relation to other branches of social sciences like sociology, economics, history and political science. Sociology deals with the social aspects of human beings. Economics deals with economic aspects of human beings. History deals with chronological growth of human beings and the institutions. Political science deals with origin and growth of political institutions and man's role as a political animal in the process of growth of political systems. But, unlike these branches, philosophical method is concerned with the final conclusions of all these branches in order to establish the broader principles underlying these branches of human activities. It is true that in understanding the world, philosophical method has a major role to play. But the present-day student is not only interested in knowing the world but he is very much interested in changing the world. It is here that the role of other methodological tools comes to acquire importance. Further it is here that the inadequacy of philosophical method lies. Thus in order to understand the content and contradictions in the world order man has to specialise himself in specific areas. Consequently various methodological frameworks have emerged.

Institutional Approach

If philosophical method is traced back to Plato and some of his predecessors, institutional approach could be traced back to Aristotle and some of his successors. That is, institutional approach is the second long standing approach to enquiring into the nature of institutions. For the first time Aristotle classified political institutions based on their functions. According to him the world systems may be classified into six forms according to their function. They are:

<i>Pure</i>	<i>Perverted</i>
1. Monarchy	Tyranny
2. Oligarchy	Aristocracy
3. Polity	Democracy

He further says that when one individual is the ruler and where the rule is in the interest of the people it is known as Monarchy. If the same individual rules in his own interest it is known as Tyranny. If a group of people rule in the interest of the people it is known as Oligarchy. If the same group of people rule in their own interest it is known as Autocracy. If it is majority rule and the rule is in the interest of all it is called Polity. If the same majority rule is in their own interest it is called Democracy. However, the main question here would be based on what Aristotle classified the systems? The available evidence shows that he classified governments based on the available official records be it constitutions or, be it records other than constitutions. Therefore, institutional approach may be defined, as Somit and Tanarchans rightly put it, "a routine description and pedestrian analysis of formal structure and processes, based on more readily accessible official sources and records." However, the problem here is the definition of institution itself. The concept 'institution' covers a gamut of institutional structures like Parliament, Secretariat, Legal Courts, Educational Institutions, etc., and it also covers certain abstract institutions like Property, Family and Caste. If one includes in the definition of 'Institution' institutions like Property, Family and Caste which do not function in accordance with legal laws that came into operation historically the institutional approach has very little to contribute. Nevertheless, from the structural point of view institutional approach has some role to play.

Some of the institutionalists have tended to include constitutions, laws that are framed to run the institutions, and the rules by which political parties are organised and elections are conducted, by eroding the difference between institutional approach and legal approach.

Some of the historians also have tended to combine historicism with that of Institutional Approach or institutionalism. According to them historical understanding is possible only when one studies the history of the institutions at different phases of human society. For example, the origin of the parliamentary institutions in India should be understood only from the point of view of advent of the British colonialism in the 16th century which naturally involved various institutions at every point of time.

However, apparently looking at, there is not much difficulty in identifying the institutions. The Government of any nation as a whole is an institution. Further all other agencies of Government are institutions. Today social scientists agree that the political parties are also institutions. The Congress Party, the Communist Party and the Janata Party involve formal offices and office-holders like, President of the Party, Secretary of the Party, etc.

Nevertheless, institutional approach as a method of social inquiry has a number of shortcomings. Indeed, the shortcomings are more than the merits. Institutions do not only consist of buildings, furniture, office records, etc., but institutions consist of people who act and react. Such action and reaction of people is coupled with the cultural background of the people or in other words, the influence of environment. That is to say, the 'values' of the people working in the institutions shape the institutions. Therefore, understanding the historical background under which an institution has grown, the behaviour of the people working in that institution at that point of time becomes more important than mere studying the records and laws that are available in the institution. It is here that the importance of historiography, empirical approach is felt.

Another important point to be noted is the influence of other agencies on institutions. For example, the influence of pressure groups on decision-making bodies, the influence of peer groups on individuals, the influence of neighbouring countries on a particular country has got to be studied in order to understand the real nature of decision or the way institutions function. Here again institutional method is inadequate to explain the phenomenon.

Furthermore, comprehending the interdependence of institutions needs a comparative approach to institutional structures as well as institutional historiography. Here also mere studying institutions by their face value is very narrow.

Thus institutional approach into social enquiry is necessary but not sufficient. Therefore, in order to understand the society and social institutions one has to couple this approach with other approaches like philosophical, historical and more particularly with empirical.

Legal Approach

More often than not social scientists interrelate legal approach with institutional approach. The reason being that there is interdependence between the law and the governmental institutions. More so in the case of parliamentary systems like India—where there is a written constitution according to which the governmental institutions run. Further, the basic function of parliament is to enact and amend the laws. The institutions that work adjoining to parliament are meant to interpret and execute the laws brought out by the parliament. For example, courts and executive bodies like ministries are meant for this. Thus, one finds a close relationship between the law and the institution.

However, one can distinguish between these two. In the first place, it is law that explains the nature of an institution. In the second place, it is law that controls the institutions. Therefore, unless one understands the nature of the law that governs the institutions it is difficult to understand the nature of institutions. That is the reason why legal approach to social problems is a necessary approach; because in the field of both domestic and international politics, law frequently prescribes the action to be taken in given contingencies and it also forbids action or fixes the limits of permissible action. Where political actions are law-abiding—as they very commonly are—knowledge of the law provides a very important basis for prediction.

Nevertheless the Legal approach has several inadequacies which need to be noted.

Firstly, law is very remotely related to many of the human activities. Many socio-political questions cannot be explained in terms of the legal framework. For example, institutional function itself depends on the capacity of individuals functioning in that institution than the given legal framework. The working of the Prime Minister depends on the person holding the position. Secondly, law does not explain the location of power. Legal position may give some amount of power to an individual which is defined, but sometimes individuals without holding any legal positions exercise tremendous amount of power. Examples vary from Jayaprakash Narayan to Sanjay Gandhi during emergency. Here again legal approach to a socio-political institution is inadequate.

Thirdly, legal approach does not explain the character of social classes—the nature of economically dominant groups over all other social groups. It also does not explain the internal contradictions of socio-political system. This can be understood in terms of the governmental actions in India. For example, government speaks very progressive language but in action it is controlled by certain economically powerful groups. Legal approach to study the governmental activities cannot sense such areas.

Fourthly, the ideologies of the individuals and groups do play a very important role in moulding social institutions and social systems. Within the given legal framework governments with different ideologies achieve altogether different goals. For example, within the framework of Indian federal system, a Congress government at state level and a government headed by the Communist Party try to perform different functions. Further, the very approach to the social problems differ based on the ideological understanding of the persons. Communists who believe in 'dialectical' method think that social problems of a class-ridden society could be solved only through class struggle, whereas others think that social problems can be solved within bourgeois legal framework. This makes all the difference.

It is here that the legal approach fails to explore areas and unfold the social reality. Thus, summing up, one can say that legal approach, like institutional approach, is a necessary approach but not a sufficient approach by itself. Coupled with other methods of social enquiry it plays an important role.

Historical Approach

When compared to the other methods like philosophic, institutional and legal, historical method is one step ahead. The word history is used in a number of senses. There is history—as actuality, history as record, and history as written; and is the name of an academic discipline. History as actuality means all that has been felt, thought, imagined, said and done by human beings as in relation to one another and to their environment since the beginning of mankind. History as record consists of documentary and other primary evidence of history as actuality. History as written is presumably based on history as record and consists of various kinds of narratives or amounts of a portion of history as actuality. Historical method, as Young observes, is the induction of Principles through research into the past and the social forces which have shaped the present.

However, historical approaches may broadly be divided into two: (1) history as record of facts; and (2) history as record of facts and interpreting the facts from a correct perspective. In other words history is the record of heroic stories of individuals and a chronological study of human development in relation to nature and other institutions. The former method does not explain anything but glorifies the individuals. For example, the political history of post independent India can be recorded as the political history of personalities like Pandit Nehru, Patel, Shastri, Jayaprakash Narayan, Indira Gandhi, etc. On the other hand, the political history of post-independent India and the development of political institutions can also be recorded from the point of view of the people of this country, their struggles and the internal and external contradictions faced by the Indian society chronologically. Further,

the former method of recording political history neglects certain important categories in the society and deals with personality of individuals, attributes either success or failure to them. The latter method attempts to explain as many points of view as possible and based on them draws generalisations.

There are several types of documents to be consulted in the historical method. Archival data is most important of all. Nan Lin gives three reasons for this. First, more and more statistical census are gathered by governments, offices, industries and others. Second, more and more such data have become readily available, partly because of the increasing interest and demand shown by the public and research community and because of computerisation of data. Thirdly, the number of data banks making available data has increased. Personal documents including life histories of people, public and private documents like diaries, secret files, literature, newspapers, etc., are the other important sources of information for those who use historical method.

Attacking the former method of history Gareth Stadmanjones opines, "history was an objective thing. It was physically recorded in mineral bundles, archives, from the public record office to the local parish church. The task of the historian was to write it up. Theory would come like steam from a kettle when it reached boiling point. The initial illusion is evident. Those who tried to create theory of facts, never understood that it was only theory that could constitute them as facts in the first place. Similarly those who focused history upon the event, failed to realize that events are only meaningful in terms of a structure which will establish them as such."

Such was the understanding of history and historical methods till recent times. But over a period of time, particularly after Karl Marx, there emerged an altogether new approach to history. The new historians did not blindly criticise their predecessors but tried to understand and estimate them in terms of their socio-economic and political situations. For example, Romila Thaper estimating the role of the old historians says, "the purpose of indicating the changing outlook of historical writing on India is not to discuss the work of the early historians has been without value or to denigrate the importance of their scholarship. The inadequacies of their interpretation were often the inadequacies of their times. For, a historian is frequently far more representative of his age than he is aware. Despite their shortcomings, these studies laid the foundations of the history of India and gave firm chronological framework, around which fresh interpretations can be constructed which will place the ideas of institutions of Indian civilization in the correct perspective."

However, it should be noted that though historical approach to social problems is one step ahead of other methods it does not alone explain the social structure in its entirety because for correct

interpretation of historical, political, social or economic events, one needs 'facts'. The collection of facts is possible only by applying other methodological tools like empirical tools. Therefore, some methodologists view that historical method has certain limitations in explaining social phenomena. Firstly, it tries to view society from partisan point of view. That is, it only facilitates in understanding the society chronologically. Secondly, it does not concern with human psychology of the contemporary society. Thirdly, it hardly explains about the nature of political institutions. Fourthly, availability of adequate and reliable data. The usefulness of the historical method, to a great extent, depends on the accuracy and thoroughness of the documents. The researcher can gain insight only when such data is available. Apart from accuracy, dispersal of available documents poses another problem to the researcher. Fifthly, the data collected through historical method and inferences drawn are not amenable for verification. Sixthly, as the historical documents, in most cases, were compiled with no supervision, errors are likely to occur in such records. Similarly 'bias' of the compiler may itself be a serious limitation.

Because of the above limitations the data have to be used keeping in view the "conditioning phenomenon" and greater care has to be taken in interpreting them. Similarly the researcher must ensure internal and external consistency of the documents before use.

One important point to be noted, however, is the development of historiography in the late 19th and early 20th centuries. Historians of this period were concerned with every aspect of social development. They sought explanation from interdisciplinary points of view. Therefore, it may be unwarranted on the part of social scientists to say that historical approach is not concerned with or it does not take into view certain social categories.

Nevertheless, in the later part of nineteenth century methodological science has evolved so much that any one approach to social problems does not explain the social reality in its totality. Hence, to understand social reality there is a necessity to combine all these methods into one. Such method is dialectical method—which is a combination of all these methods. It is this method which would examine the social system from a total and correct perspective.

Scientific Method

R. Ravindra Sastry

Scientific method is a branch of study which is concerned with observed facts systematically classified, and which includes trustworthy methods for discovery of truths. The method of enquiry is a very important aspect of science; perhaps this is its most significant feature. Scientific method alone can bring about confidence in the validity of conclusions. It would be difficult to comprehend the nature and content of research without an appreciation of the method we designate as scientific. Research is an endeavour to discover answers to problems (intellectual and practical) through the application of scientific methods to the knowable universe. Thus it is clear that science is rather a method than a field of specific subject matter. Aristotle was referring to this method of dealing with facts when he said that science "begins when, from a greater number of experiences, one general conception is formed which will embrace all similar cases." As Wilkinson and Bhandarkar put it, "science is an intellectual construction—a working thought—model of the world and its aim is to describe and conceptualize the impersonal facts of experience in verifiable terms, as exactly as possible, as simply as possible and as completely and meaningfully as possible."

George Lundberg defines scientific method as one consisting of systematic observation, classification, and interpretation of data. The main difference between day-to-day generalisation and the scientific method lies in the degree of formality, rigourousness, verifiability and general validity of the latter. Scientific method is marked, according to Karl Pearson, by three features, viz., careful and accurate classification of facts and observation of their correlation and sequence; discovery of scientific laws with the aid of creative imagination; and self-criticism. To Wolfe any mode of investigation by which science has been built up and is being developed is entitled to be called scientific method. All these definitions emphasise the method of enquiry as the most important factor which distinguishes scientific method from other methods of enquiry.

According to Cohen and Nager, the first characteristic of scientific method is its nature of "non-imposition". This means that the method aims only at discovering facts as they actually are and not

as they are desired to be. Secondly, scientific method deals with "felt-problems", or specific issues. The scientific enquiry comes to an end when once the problem is solved. Thirdly, the method is said to follow a path of systematic doubt. It is always prepared to repudiate any theory if the established facts so demanded. Fourthly, scientific enquiry is "circuitous". It proceeds from weighing evidence, appraisal of facts to experience and from experience to facts. It is rational in the sense that it is more particular about the consistency of the method followed rather than the result likely to follow. The method suspends judgement and its chief social condition is widespread desire for truth. Fifthly, the merit of scientific enquiry lies in its emphasis on "verification and proof". Thus it makes possible through a combination of relevant observations and logical verifications of the phenomenon.

Universality is another feature of scientific method. Science is not concerned with individual objects but is concerned with types, kinds and classes of objects. Complete universality, however, is a myth in social sciences due to heterogeneous nature of social phenomenon. Another feature is predictability; depending upon the nature of the social phenomenon and knowledge of the various causative factors it is possible to predict the phenomenon with sufficient accuracy.

Procedural Components

Observation, hypothesis and verification are the three important components of scientific enquiry. Observation which serves as the basis on which hypothesis is built itself depends upon the available data in the form of literature and other materials already developed in the field of investigation. Observation as a process in the course of inquiry figures at two different stages. In the early stages of investigation it helps in formulating the hypothesis. The second stage of observation comes into picture as a means to collect data for the verification of the hypothesis.

The second stage in the process of inquiry is the formulation of hypothesis. Hypothesis should never be taken as an established theory. It is merely a testable proposition whose purpose is only to indicate the direction in which investigation should be carried on.

The third and final stage of scientific method is that of verification. Verification involves three aspects namely, 1. Collection of data; 2. Analysis of data; and 3. Interpretation of data.

Assumption of Scientific Method

David Easton has laid down certain assumptions and objectives of scientific method. They are as follows: 1. Regularities, 2. Verification, 3. Techniques, 4. Quantification, 5. Values, 6. Systematisation, 7. Pure Science; and 8. Integration.

1. *Regularities*: Scientific method believes that the world is regular and phenomena occurs in patterns. Further there are certain discernible uniformities in political and social behaviour, which can be expressed as generalisations which are capable of explaining and predicting political and social phenomena. The task of science is to ascertain what these patterns are in the natural world. A scientific study must be public. Different individuals can investigate independently and possibly arrive at the same conclusions. For example, when, two parts of hydrogen and one part of oxygen is added, the components should produce water. There is nothing secret or personal about it. This can be done publicly and all people can arrive at the same conclusion.

In the field of political science the studies of voting behaviour show that voters are known to vote in the same manner, for the same individual or political party through successive elections and if this behaviour can be linked up with their social status, economic position, professional loyalties, caste affiliations, etc., the pattern may very well emerge.

2. *Verification*: Scientific method presupposes that knowledge, in order to be valid, should consist of propositions that have been subjected to empirical tests, and that all evidence must be based on observation. Claims to knowledge must refer to concrete human experiences so that verification is possible. Science is thus empirical. Experience has come to represent the true test of science. One can not establish true scientific facts unless one can experience them.

3. *Techniques*: Scientific method attaches a great deal of importance to the adoption of correct techniques for acquiring and interpreting data. In order to make the researcher self-conscious and critical about the methodology, there is need for the use of sophisticated tools—like multi-variate analysis, sample surveys, mathematical models, simulations, etc. This would enable the researcher to discount his own value preferences in planning, executing and assessing his research work. The technique should be so refined and validated that rigorous means could be found for observing and analysing data.

4. *Quantification*: Science necessarily involves mathematical formulas and measurements. Theories are not acceptable if they are not expressed in mathematical language. Unless imprecise qualitative judgements are replaced by rigorous measurement and data organisation procedures, it would not be possible to obtain precise and accurate knowledge about the complexities of phenomenon. All observations must be quantified because quantification has advantages in terms of precision and manageability.

5. *Values*: Values and facts are two separate things. Science, it is claimed, is value free. It is not concerned with what is 'good', 'right', 'proper', 'desirable', etc. 'Good' and 'bad' are the concern

of philosophers. Ethical evaluation is different from empirical explanation. 'Democracy', 'equality' or 'freedom' may be excellent values to uphold, but their truth or falsity cannot be proved in a scientific manner. Scientific inquiry to be objective, therefore, must be value free. Social sciences should be studied scientifically through empirical methods and it will have nothing to do with moral or ethical questions.

6. *Systematisation*: Scientific study demands that research should be systematic. It means it must be theory-oriented and theory-directed. The theory and research should form interrelated parts of a coherent and orderly body of knowledge. It is said that research untutored by theory may prove trivial and theory, unsupported by data, futile. Theory does not consist of speculation and introspection but of analysis, explanation and prediction. It is on the basis of a well organised, logically interrelated structure of concepts and propositions that hypothesis have to be advanced. The hypothesis, in their own turn, have to be capable of undergoing rigorous testing and, then alone, should form the basis of new theories.

7. *Pure Science*: Scientific minded social scientists insist on pure science approach. They agree that theoretical understanding may lead to an application of this knowledge to problems of life. Both the theory and its application are parts of the scientific enterprise. But the understanding and explanation of social behaviour logically precedes efforts to utilise that knowledge in the solution of urgent practical problems of society. They, therefore, attach great importance to pure research and would be content with it even if it cannot be applied to specific social problems.

8. *Integration*: Finally, there is the question of integration of each social science with other social sciences. The behaviouralists agree that man is a social animal and while one may try to draw boundary lines between the social, political, economic, cultural and other activities, none of these activities can be understood without placing them in the wider context of his entire life. The study of a political phenomenon, therefore, requires some understanding of how the economic, cultural, and other phenomena in society are unfolding themselves. If an effort is made to detach the political man from the economic, social or cultural man, it would not be possible to understand his political behaviour in its true character. Therefore a complete and a total perspective comes only through interdisciplinary approach.

Steps in the Scientific Method

In social science research procedures of enquiry differ from study to study depending upon the phenomenon under study and the researcher's knowledge and skills. However, five broad and distinct steps can be discerned in the scientific method. They are:

1. Formulation of hypothesis;
2. Defining concepts;
3. Establishing working definitions;
4. Collection and analysis of data; and
5. Relating the findings to the existing knowledge and generalisation.

The above steps are closely interrelated and no research proceeds in the order given above. But the identification of these steps enables the researcher to proceed with his research systematically without any conclusion.

Formulations of hypothesis, which is a tentative proposition whose validity remains to be tested, is the foundation of all scientific research. It gives direction to the inquiry and helps the researcher to draw specific conclusions.*

The second step is to define concepts used in the hypothesis. Some concepts represent facts and others like attitudes, cannot be related to phenomena and can only be inferred. But the definition of concepts should be done in abstract terms to link the results of the study to the existing body of knowledge. It also helps the researcher in the collection of data.

The third step is to establish working definitions relating to the topic. This enables the researcher to translate the concepts into observable events to carry out the enquiry.

The fourth step is collection and analysis of data. Once topic is decided and working definitions established, the researcher based on the requirements has to choose his research tools i.e., the appropriate methods for collection of data. The methods may be observation, survey, interview method or historical documentary method. After the collection of data it has to be processed and analysed which in itself may involve several stages.

Finally, the results of the study have to be related to the existing theories or concepts either to confirm them or to demolish them in the light of the study undertaken.

Scientific method, however sophisticated it might look, however impressive and fascinating its assumptions may be, is not free from certain defects. The following are the major problems in scientific method:

1. Science suffers from extreme weakness of its failure to explain abstract and formal procedures. However, it is interesting

*For details of hypothesis see the Chapter on *Formulation of Research Problems*—Eds.

to find science to explain by analogy. But, such analogy though it may seem fascinating and curious, is in the main illusory. Moreover abstract and formal theory of science in the strict sense has nothing in it that can be said to constitute even a satisfactory explanation of at least ordinary type.

2. Science suffers the imperfections relating to the vast 'disagreement' among scientists themselves about certain of the deepest and most central aspects of science. This imperfection of science reflects the fact that science is not monolithic, but is a human enterprise, exhibiting the same lively and useful diversity which one finds in philosophy, art, music, etc.

3. Science is essentially mathematical or statistical. Because of this, the conclusions may be regarded as being 'probable' but by no means accurate and absolute. This, in other words, means that even in the field of science, perfect accuracy is unattainable in any measurement and that certainty is not possible in any prediction. For example more often than not predictions regarding weather forecast go wrong.

4. The limitation on science also relates to the loopholes which characterise the deductive as well as the inductive reasoning followed by logic, which is the very basis of science. Deductive process in proceedings from the general assumptions to the particular phenomena. This method is defective in two important respects. According to Godel it is not possible to prove the consistency of any set of postulates which is rich enough in content to be interesting, and deductive system is an incomplete system. Within the system, it is always possible to ask questions which are undecidable.

5. Another imperfection is "concerning its objectivity". Any natural event has a number of possible explanations. Moreover, it has also been proved that a body of experiences which fit into a theory can as well be interpreted in an equally consistent fashion by several other theories also. As a matter of fact what is called a "knowledge of facts" is usually merely a "subjective realisation". One cannot say that knowledge is or can be impersonal. There is no permanently fixed framework within which critical testing can occur. Even in an exact science "knowing" is an art of which the skill of the knower, guided by his passionate sense of increasing contact with the reality, is the logically necessary part.

6. The social sciences deal with dynamic social phenomenon. One cannot, therefore, conduct tests under guided conditions as in physical sciences. This creates many problems to the researcher like problems of subjectivity and intangibility of the social phenomenon.

7. Bias of the researcher is another problem. Bias may relate to ambition, optimism, pessimism, cynicism, language, political,

etc., factors. Such a wide range of bias creates the problems to objectivity in research.

Finally, social sciences deal with human behaviour which is too elusive, subtle and complex. Any change in human behaviour—deliberate or accidental—upsets the enquiry and the predictions.

However, notwithstanding the inherent defects in the social sciences while applying the scientific methods, there is no other method which can be an alternative. In the absence of other methods, scientific method can be acceptable with its own limitations. Social scientists should take all possible precautions to minimise the limitations.

Viewed in the above manner, there is nothing absolute in nature about the empirical basis on which science is said to rest. In fact, it is necessary to realise that these imperfections are not inherent in the nature of science as such in any way. On the contrary, it is the attitude of the scientist and non-scientist alike that might account for these imperfections brought about in and attributed to the method of scientific inquiry.

Scientific Objectivity in Social Sciences

D.L. Narayana

Scientific method, according to Karl Pearson, means the classification of facts, recognition of their sequence and relative significance in the function of sciences and the habit of forming a judgement upon those unbiased by personal feeling is characteristic of what may be termed the scientific frame of mind. The scientific method of examining facts is not peculiar to one class of phenomenon and to one class of workers; it is applicable to social as well as to physical problems and we must carefully guard ourselves against supposing that the scientific frame of mind is a peculiarity of the professional scientist.

Scientific method which is the only gateway to knowledge bristles with several problems in social sciences rendering their knowledge more difficult and less accurate than that of sciences.

The prime weakness of social sciences generating different limitations to the scientific method arises out of their direct and indirect concern with the study of man and his behaviour. Goode and Hatt noted for such aspects of the human behaviour, viz.,

- (1) "Human behaviour changes too much from one period to the next to permit scientific, exact predictions.
- (2) Human behaviour is too elusive, subtle and complex to yield to the rigid categorisation and artificial instruments of science.
- (3) Human behaviour can be studied only by other human observers, and these always distort fundamentally the facts being observed, so that there can be no objective procedures for achieving the truth.
- (4) Human beings are the subject of such predictions and have the ability deliberately to upset predictions we made."

These characteristics of human behaviour constitute a weak scientific foundation to social sciences. For, the study of truth becomes infinitely variable, unique and non-measurable rather than one of repetitive, simplifiable and observable behaviour. Probably

it may be possible to find out the taste of potassium cyanide accurately rather than the prediction of human behaviour governed by a complexity of factors. Human behaviour is "more complex" and "more mysterious" than that of nuclear forces. Hence the need to develop methods of controlling observations, abstracting adequately and reducing variability and complexity so that social sciences become more scientific. It is true that even the physical theories of Newton and Einstein are themselves approximations. But it is harder to derive valid and useful generalisations about human behaviour because the socio-economic situation is always changing and because human beings are unpredictable individuals.

In spite of the development of sophisticated techniques in social sciences, prediction and forecasting about the business activity is still hazardous for the economist or the businessman because their work does not lend itself to orderly and close analysis as in physics. The physicist can exclude "outside" disturbances, such as national elections or wars, from the particular system of atom he is studying. The social scientist cannot really exclude anything that affects the society and economy. His system is "open"—open to the storms of political, social, technological, psychological and even climatic changes. His very perception of reality tends to be weak, his seemingly hard and precise methods are soft, synthetic, and inaccurate reflections of underlying events and methods and tendencies.

The problem of achieving scientific objectivity is still worsened because of the bias of the social scientists governed by conscious or unconscious political and social attitudes and values. It matters much whether one is a follower of Marx or Malthus; whether he belongs to a conservative party or a radical party. It cannot be neglected whether the social scientist identifies himself with the rich or poor or the middle class. It is still a matter of great significance whether he is a capitalist, socialist or communist. Whether one is a disciple of Jesus or Gandhi equally matters. Attitudes towards political and economic freedom raise questions not merely scientific but political, philosophical and moral ones. It would help if social scientists make their political and social values explicit, rather than pretending to a spurious scientism. "Unfortunately, concealed biases and interested political or economic motives commonly corrupt both economic analysis and policy."

It is interesting to note the wide range of bias that can prevail among individuals. Constituting the sources of bias from a micro-point of view are (1) Selfishness, (2) over-ambition, (3) friendship, (4) relationship, (5) caste and community, (6) class, (7) religion, (8) localism, (9) nationalism, (10) language, (11) political party, (12) profession, (13) opportunism, (14) sexual bias, (15) business, (16) careerism, (17) group bias, (18) temperament bias, (19) power bias, (20) personal bias, (21) pessimism, (22) optimism, (23) fanaticism, and (24) militancy. Guarding against such biases becomes a

matter of perpetual vigilance for a true social scientist. Skilful social scientists may weave their biases into theories, project intellectual gymnastics and generate conflicts and controversies. The background of different theories and their conflicts will be better appreciated when their assumptions and viewpoints are clearly stated. Hence, scientific method postulates the clear statement of assumptions and viewpoints.

Great social scientists project their viewpoints in their theories and writings. The proletarian interpretation of Karl Marx, Bertrand Russel's power interpretation of social order, Freud's sex interpretation of society, Fabian socialism of George Bernard Shaw and Gandhiji's philosophy of simple life are illustrations.

Even great social scientists are not free from temperamental bias. Although Karl Marx has attempted the greatest possible synthesis of social sciences bias on his dialectical materialism and economic interpretation of history, projecting class struggle biased on his proletarian philosophy, his temperamental antagonism to capitalism was quite obvious as he suffered a lot due to poverty and penury. When his bag and baggage were thrown out for non-payment of guest charges, he ironically expressed, as he was suffering from carbuncles at that time, that capitalism will not forget his carbuncles which he had inflicted on capitalism by his theoretical formulations that is destined to die because of its own inherent contradictions to be replaced by socialism, evolutionary or revolutionary as the case may be. The power of ideas of his analysis has had its impact in shaping the history of Russia, Red China and other countries of the world.

The work of a scientist is confined to the four walls of a laboratory, whereas the laboratory of a social scientist is as vast as the entire society which is too big for comprehension even as for the scientific method of discovering the knowledge with its uniformities and generalisations holding good even under similar circumstances. The very scope of the work of a social scientist is too vast to provide precise verifiable knowledge.

While a scientist can conduct experiments repeatedly under his own control with a grip on all the conditions governing the operation, a social scientist cannot conduct similar experiments. Society is not amenable directly for experimentation. Only through study and observation a scientist has to arrive at verifiable knowledge with its generalisations.

The formal logic of two plus two making four holds good in sciences, but in social sciences, they may make four, more than four or less than four depending on the circumstances. For instance if the rate of taxation, direct or indirect, is doubled, there is no guarantee that the revenue will be doubled. Under direct taxes, evasion increases, correspondingly revenue decreases. At times a

marginal increase in tax rate may produce greater increase in revenue, if it is a boom period. While sciences are exact, social sciences tend to be less exact.

Social problems involving multiple causes and interdisciplinary approach create complications of assessing the exact role of different causes and the significance of different social sciences whose borders overlap. "I have been gradually coming under the conviction, disturbing for a professional theorist," says Kenneth Boulding, "that there is no such thing as economics—there is only social science applied to economic problems. Indeed, there may not even be such a thing as social science—there may only be general science applied to problems of society."

Unless these social problems, which are largely economic in nature, and among the most important that mankind has, are not dealt with, they can lead to more awful problems, and even result in the breakdown of societies. Social scientists must try to deal with those difficulties rationally and at the same time cope with the conflicting pressures of special interests and vested interests, the turbulent political contests and the uncertain future that engulfs the decision-making. It is no wonder that economists frequently disagree among themselves. The endless differences among them, on both analytical and policy issues, demonstrate the insecure state of the discipline. Many of the disputes, however, stem also from their different values, consciously or unconsciously and the economic and political interests they represent. At times they may be due to intellectual gymnastics arising out of fertile thinking.

The Swedish economist and Nobel prize winner of 1974, Gunnar Myrdal is convinced that "problem in the social sciences not only the practical ones about what ought to be done, but also the theoretical problems of ascertaining facts and the relations among facts—cannot be rationally posted except in terms of definite, concretized and explicit value premises." Curiously enough, Frederick Von Hayek, who shared the prize with Myrdal, regards Myrdal's kind of socialist economics as "the road to freedom." Hence, is economics one science or many?

The answer would seem to be, particularly at the level of national policy, that economics is not only many sciences but also something more—a branch of statecraft, of political philosophy, in which analytical method and technique cannot substitute for intuition and judgement.

John Maynard Keynes, the father of macroeconomics and mixed economy, once described the singular difficulties of economics in this way: "Professor Planck, of Berlin, the famous originator of the quantum theory, once remarked to me that in early life he had thought of studying economics, but had found it too difficult: Professor Planck could easily master the whole corpus of mathematical economics in a few days. He did not mean that, but the

amalgam of logic and intuition and the wide knowledge of facts, most of which are not precise, which is required for economic interpretation in its highest form is, quite truly, overwhelmingly difficult for those whose gift mainly consists in the power to imagine and pursue to their farthest points the implications and prior conditions of comparatively simple facts which are known with a degree of precision." Hence the job of an economist like the social scientist calls for a genius with intuition and judgement which may be rare. Intuition and judgement in certain areas of social sciences where quantification if not possible or not worthy of its cost, is a necessity to supplement the scientific method.

A good scientific method has to satisfy several requisites. For example the Advisory Committee on Economics and Social Research in Agriculture of the Social Science Research Council summarised the essentials of good scientific method as under:

1. Careful logical analysis of the problem, isolating it from other problems and separating its elements. This means, in some cases the formulation of an hypothesis, in the proper meaning of this expression—a trial hypothesis that will point the investigation.
2. Unequivocal definition of terms and concepts and statistical units and measures, so that others will understand exactly, and be able to repeat the analysis and test the generalisations.
3. Collection of cases and data pertinent to the subject on hand.
4. Classification of cases and phenomena and data.
5. Expression of factors in quantitative terms whenever possible.
6. Rigorous and exacting experimental or statistical procedure in summarising the data and in isolating the attributes or variables and measuring their relationships and inter-effects.
7. Statement in unassailable terms of the exact conclusion that warranted for the cases examined.
8. Sound logical reasoning as to the bearing of these conclusions on the trial hypothesis and in the formulation of generalisations.
9. Statement of conclusions or generalisations definitely and clearly so that others will be able to check them.
10. Complete elimination of the personal equation.
11. Complete and careful reporting of the data and the methods of analysis so that others can check the analysis, or test the generalisations with new sets of data.

Objectivity in Social Science Research

G. Haragopal

M. Vanamala

Building up a dependable body of knowledge about the social reality is a prerequisite for any effective action strategy in human affairs. The large scale inaction that is strikingly evident in the third world countries even in the face of threatening problems indicates the inadequate awareness of the reality. This further indicates the snail pace growth of knowledge in social sciences. Chronologically social sciences are much older to natural sciences. But while the latter made rapid strides, the former has been lingering far behind. Commensurate with advancement in social technology, it is essential for the creation of a new and a better world. The mechanical progress of the science and technology triggers production, ignoring the problems of production relations and distributive justice. It is therefore necessary that there is a balanced growth of knowledge based on the social realities.

Knowledge, to be meaningful, should have a definite purpose and direction. This is possible only when it is rooted in the concrete reality. For in the learning process "people come to a new awareness of selfhood and begin to look critically at the social situation in which they find themselves and often take the initiative in acting to transform the society." Further "better knowing the reality results in better transforming it." Inadequate explanation of the reality or its distorted interpretation renders the knowledge ineffective and irrelevant. Irrelevant knowledge has a strong propensity to encourage either inaction or irresponsible action. Therefore, there is a need to re-examine the very process of growth of knowledge in social sciences. The criticism often levelled against social sciences that they are irrelevant should be examined in this light.

The growth of knowledge is closely linked to the methods and approaches used in research investigation. The researchers labouring to push the frontiers of knowledge forward did not succeed as much as they ought to. For the social phenomenon remained as such an enigma to the social scientist as to the lay-man. Till today the failure of planning, the slow rate of rural development, the erratic political process and inefficient and corrupt bureaucracy

etc., are not thoroughly explained and understood so as to enable people to evolve a course of action. This calls for deeper understanding of the socio-economic processes and their inter-relations. The social scientists lack an insight into the working of varied forces that determine the nature of change. It is this insight that can contribute to the understanding of change and help in directing it. Judged from this angle the present condition is far from satisfactory. This state of social science knowledge warrants an analysis and explanation. This paper attempts to examine one of the dimensions of methodology viz., objectivity.

Presently, the research methodology courses are organised by both the universities and research institutes to impart research skills. These methodology courses attempt to equip the social scientist with most of the statistical skills to enable him to quantify the qualitative variables. It is claimed that statistical tools are capable of objective understanding of the social reality. Objectivity, therefore, is considered to be the heart of any meaningful social enquiry. The need for huge grants, large scale organisations and extensive field studies are not required if one has to theorise his subjective experience. In fact the whole effect is to overcome this subjective judgement and see that the reality is explained based on the larger experience of the society.

There has been hardly any research or debate without a mention about the objectivity. According to Green, "objectivity is the willingness and ability to examine evidence dispassionately." Carr also observed, "objectivity of truth means that the phenomenon world is a reality independent of beliefs, hopes or fears of any individual, all of which we find out not by intuition and speculation but by actual observation." The objective observer must "above all things... strive at self elimination in his judgements and provide an argument which is as true for each individual mind as his own." But it has to be very seriously examined whether it would be possible for an individual to overcome his subjective judgement and is it so much necessary for an investigation to be totally oblivious of his own value framework. All persons living in a society are bound to have a set of values, conscious and sometimes unconscious, through which they perceive their surroundings. Most of the time a person picks up a set of values through his socialisation process and the economic class to which he belongs. These values constitute his 'Intellectual property' which he tends not only to cling to but aggressively defends them. As a result, the possibility of a researcher contributing to knowledge more from what he believes rather than from what he investigates is quite large. If one is excessively conscious of his value framework and wants to escape from its influence, he is also likely to go astray because of the internal conflict between his belief structure and his desire to be objective. Either way the researcher is on a slippery ground. The subjective biases in the social research is a result of adverse influences of personal motives, custom and social situation of which the

social scientist himself is a part. Guarding against the subjective biases becomes a matter of continuous occupation to a true social scientist.

The ideological division in the world introduced a new element in methodology. Those who profess an ideology frankly through their writings are fair enough and do not contribute to confusion. The complexity arises from those writings which conceal the values in their analysis and pass on information in the name of science. This can be clearly noticed in a branch of knowledge like economics. Economics is one branch of social sciences which is relatively more developed as greater effort of the world scholars has gone into it. Here a brief attempt is made to highlight the value premises of this body of knowledge.

Down from Adam Smith to the latest thinkers on economics, there has not been much difference in the value premises of their theories and models. The classical and neoclassical economic theory is heavily value loaded. For instance Ricardo in his theory on rent assumes that rent is the reward for mere ownership of the means of production but not a payment for effort expended. Further the theory makes no effort to go into the dynamics of ownership claims over the means of production.

Similarly the neo-classical economics like Keynes in his theory on full employment advocates that consumption expenditure and investment expenditure should simultaneously increase for the creation of full employment. This might well suit a capitalist society. In these analyses the nature of consumption needs and production of consumption goods has not been analysed. In a developing economy there is a need for postponing the consumption of luxury goods and hastening the production of mass consumption goods. And the argument that the government expenditure should be reduced evidently favour private sector.

Irwing Fisher in his quantity theory maintains that increase in the volume of money results in increase in prices. But he ignores that in a developmental process increase in the volume of money is inevitable to increase the production. However prices can be better regulated by the state intervention.

In other theories such as Investment theory, Interest theory, Price theory, Supply and Demand theory, Marginal productivity theory etc., the major assumptions are the private ownership of means of production, free interplay of market forces and minimum intervention of the state in regulating the economic life of the society. Thus one can discern the value bias of the economists in building their theories and models. The same thing is true in the case of political theory, administrative science, sociological theories and even the theories of human psychology. It is against this background that the concept of objectivity should be examined.

The above analysis reveals that social scientists conceal their values in their theories in the name of objectivity. As a result the explanations and interpretations of social phenomenon are not only distorted but misleading. This renders the grasp of the reality extremely difficult. Therefore there is necessity to re-examine the concept of objectivity so as to bring in greater frankness and clarification in the concepts and methodologies.

Gunnar Myrdal pleaded, as a safeguard against the above danger, value frankness in the place of value concealment. If every social scientist makes his value bias clear, it is easy for others to know the inner content and direction of the interpretation much better. For if objectivity means value neutrality, it is an impossible state of mind.

The whole debate on objectivity may have some relevance in gathering the facts but not in their interpretation. Most of the research techniques and methodological sophistication is directed towards this factor. Facts by themselves do not convey much unless they are interpreted. Those who lack a clear conceptual framework end up in confusion. Such exercises either are dysfunctional or have limited value. Therefore a good piece of social science research depends on objective collection of facts and their conscious interpretation.

As social science research cannot be value free, the question of values of the individual researcher should receive greater attention. Each social scientist engaged in pursuit of knowledge must be enabled to understand his own value framework more clearly and effectively. Effort should also be made to understand and analyse how the values of individuals are shaped and this process must be highlighted so that the level of awareness of the individual social scientist is raised. It is this factor that is largely ignored in the debate on methodology. This is partly on account of our imitation of methodology of natural sciences.

The major difference between the social science research and natural science research lies more in the object than in the subject. The natural scientist bases all his analysis on the data he gathers, through scientific methods. But it is observed that most of them including those who are known for outstanding research work do not take a scientific view in the day-to-day affairs of life and the society. This split personality of a natural scientist continues to be an enigma. It does not, however, adversely affect the growth of scientific knowledge although this does affect the application of knowledge to the progress of the society.

Unlike the natural scientists, the personal value framework of the individual social scientist is of cardinal significance. The perceptions, life experiences, the socio-economic roots of the individual, his approach to life etc., have a critical role to play in his research

pursuits. Personal courage and convictions also determine the quality of his analysis. Although such qualities in a natural scientist add to the quality of his works, their absence would not paralyse him in understanding the nature. However, it does affect his understanding of the relation of man with nature.

The social scientist cannot imitate the natural scientist as his lab is complex and he himself is an integral part of the phenomenon. The social scientist like the natural scientist cannot have a split personality, for there is not much difference between his life and his lab. Therefore the question arises whether the social scientist can take a contradictory approach to his day-to-day life and research. Avoidance of these contradictions involve a painful process of doubting, challenging and unlearning many beliefs and myth around which a society is built.

The social scientist should be a scientist not only by profession but by living. He has to enlarge his range of experience and broaden his value framework which would include the larger experience of the society than his own individual experience. In fact the alienation of the social scientist from the larger experience of the society accounts partly for the lopsided grasp of the reality and inadequate analysis which is not capable of building valid theory.

Today in India our understanding of economic, political and social system is so poor that any major event baffles the social scientist as much as it does a person who did not go through the social science training. How the society is undergoing change and in what direction different forces are pulling it are not properly understood. This only shows how remote are our analysis to the reality. This is largely due to our failure to grasp what is going on particularly in the rural sector. The urban background, the impact of Western models and dis-association from peoples' experience resulted in such a poor analysis of the system. Therefore, the future of social sciences and their utility depends more on the preparedness of the social scientist to live as scientist and expand the base of his subjective experience by perceiving the changing consciousness of the people than on methodological sophistication and refinement. Those social scientists who can associate themselves with peoples' organizations and can directly experience the events would be in a better position to explain the reality. Their explanation would be of immense utility in not only understanding the social phenomenon but would lay stronger foundations to the building up of a dependable body of knowledge.

The problem of objectivity, therefore, is more an issue of 'scientific bias'. The bias not based on narrow mental constraints but bias towards the larger experience of the people and placing scientific truth above the personal privilege and interests. Personal

courage, constant unlearning, clarity in value premises and commitment to the people is likely to help the social scientist to develop a right type of bias which can be a substitute to the 'objectivity' that has come to engage the attention of social scientists all over the world. It is such a bias which would help us in building authentic knowledge which can provide an effective link between the theory and action.

Formulation of a Research Problem

C. M. Abraham

The term problem comes from the Greek *Proballein* which means anything thrown forward; a question proposed for solution; a matter stated for examination. R. S. Woodworth defines problem as "a situation for which we have no ready and successful response by instinct or by previously acquired habit. We must find out what to do." John Dewey writes, "the need of clearing up confusion, of straightening out an ambiguity, of overcoming obstacles, of covering the gap between things as they are and as they may be when transformed, is, in germ, a problem."

The selection of a topic for research does not immediately put the investigator in a position to start considering what data he will collect, by what methods, and how he will analyse them. Before he takes these steps, he needs to formulate a specific problem which can be investigated by scientific procedures. "For it is an utterly superficial view, according to Cohen and Nagel, "that the truth is to be found by studying the facts. It is superficial because no inquiry can ever get under way until and unless some difficulty is felt in a practical or theoretical situation. It is the difficulty of problem, which guides our research for some order among the facts in terms of which difficulty is to be removed."

Scientific inquiry is an undertaking geared to the solution of problems. The first step in formulating the research is to make the problem concrete and explicit. A research worker should identify some aspect of the topic which can be formulated into a specific research question which it is feasible to investigate with the resources available.

As an example of the process of formulating a research problem within a general subject-matter area, let us consider a study by G. Ram Reddy on Panchayati Raj. This is a general topic. There are several aspects of Panchayati Raj, viz., administrative, financial, political, sociological, etc. Similarly there are several units of Panchayati Raj viz., village, block and district. Clearly it was not feasible to consider all aspects of Panchayati Raj within the limits of a single study. One of the first steps, then, was to select a topic that would yield a task of manageable size. Ram Reddy chose to focus on the question of Block Administration in Andhra Pradesh.

Having thus narrowed the problem to one that could reasonably be handled within a single study, he proceeds to several interrelated steps; formulation of hypothesis; clarification and formal definition of the concepts used in the study, specification of kind of evidence that could serve as indication of the various concepts, etc.

Criteria of a Good Problem Statement

A good problem selected by the researcher should conform to the following criteria: Firstly, the problem should express a relation between two or more variables. It asks question like—Is A related to B? How is A related to B?

Secondly, the problem should be related clearly and unambiguously in question form. Instead of saying—"The problem is" "The purpose of the study is," ask a question. Questions have the virtue of posing problems directly. A problem is then an interrogative sentence or statement that asks: What relation exists between two or more variables? The answer to the question is what is being sought in the research? For example, do teacher comments cause improvement in student performance? What are the effects on pupil performance of different types of incentives?

Thirdly, the problem should be such as to imply possibilities of empirical testing. This means not only that an actual relation is stated, but also that the variables of the relation can somehow be measured.

Normally the researchers select any particular problem based upon several factors. The following factors may direct the scholar to prefer one topic over the other:

1. to satisfy a personal interest or curiosity,
2. to furnish a basis for confirming some earlier study or a basis for some future study,
3. to meet a social need, or
4. to serve a utilitarian purpose like personal ambition.

The criteria for the selection of a problem may be, interest of the researcher, amenability of the problem for research and feasibility of the problem from the point of view of resources. Goode and Hatt give the following criteria for the selection of a problem:

1. The researcher's interest, intellectual curiosity and drive,
2. Practicability,
3. The urgency of the problem,
4. Anticipating or expected outcomes. Their importance for the field represented and implementation, and

5. Resources, training and personal qualifications of the personnel; availability of special equipment, data, methods, time and sponsorship and administrator's cooperation.

Similarly Cocharan and Cox suggest that the prospective researcher should put the following questions and select the problem for research:

1. Does the field appeal to my interest ?
 - (a) Is the interest purely intellectual ?
 - (b) Is the interest present because of reward of pecuniary returns, possibility in advancement in position and increased authority ?
2. Will the results be of practical or utilitarian significance ?
3. Does the field present gaps in verified knowledge which need to be filled ?
4. Does the field require reworking or recasting ?
5. Does the field permit extension of inquiry beyond the present limits or verified knowledge ?
6. Is the field pivotal or strategical from the standpoint of immediate purposes which the results of the proposed investigation are to fulfil ?

Notwithstanding the different criteria discussed above, the selection of a research problem remains a difficult and ticklish aspect of research, particularly to the uninitiated. Apart from the criteria discussed above study of the literature on the topic and related topics, and discussions with persons who have direct knowledge and practical experience in the field, would immensely help the researcher in the selection of a problem.

Selection of problem, however, raises two important issues, viz. whether the problem should be selected keeping in view its scientific significance and ethical neutrality or its importance from social, political or historical points of view or its implications for human welfare.

Talcott Parsons, for example, advanced the following point of view: "It is not a question of whether we try to live up to our social responsibilities, but of how. If we should put the overwhelming bulk of our resources, especially our trained talent into immediate practical problems, it would do some good—but I have no doubt that it would have to be at the expense of our greater usefulness to society in future. For it is only by systematic work on problems where the probable scientific significance has priority over any immediate possibility of application that the greatest and most rapid

scientific advance can be made." Parsons' position states the importance of "scientific" definitions which focus on immediate practical problems.

C. Wright Mills takes the opposite stance in viewing the selection of problems: "... whether he is aware of it or not, any one who spends his life studying society and publishing the results is actually morally and usually, politically as well. The question is whether he forces this condition and makes up his own mind or whether he conceals it from himself and from others and drifts morally. Many, I should say most, social scientists in America today are easily or uneasily liberal. They conform to the prevailing fear of any passionate commitment. This and not 'scientific objectivity' is what is really wanted by such men when they complain about 'making value judgements'."

Mill's argument is that social scientists often use scientific objectivity as an excuse for an uncritical acceptance of the framework of society and that, as a result, they spend their intellectual force "on the details of some small-scale milieu" instead of concentrating on the large problems of society.

Parsons' position stresses the importance of allowing latitude for the investigator to define problems in terms of their 'scientific' significance. Mills maintains that ethical neutrality in the selection of problems is a fiction, and that those who profess it tend to take the safe road of avoiding a certain class of those scientific problems, the conclusions of which may imply fundamental criticism of social institutions.

It seems that the debate has pointed up a central question. Which strategies for the selection of problems can maximise the advancement of scientific knowledge as well as the solution of important human problems?

Formulation of a Working Hypothesis

Going hand in hand with the selection of a research problem is the formulation of a suitable hypothesis. Hypo means less than and thesis means a generally held view. Hypothesis is a less than generally held view. It is an assumption or proposition whose tenability is to be tested. It is a supposition the validity of which remains to be tested.

Webster's dictionary defines hypothesis as "a proposition, condition, or principle which is assumed perhaps without belief in order to draw out its logical consequences and by this method to test its accord with facts which are known or may be determined": George A. Lundberg defines hypothesis as "a tentative generalization, the validity of which remains to be tested. In its most elementary stage the hypothesis may be hunch, the basis for action or investigation.

It is a proposition, say Goode and Hatt, which can be put to test to determine its validity. These definitions suggest that hypothesis is a conjectural statement of relationships between two or more variables. However, hypothesis is not theory though it is related to it. As W.H. George has put it that theory is an elaborate hypothesis.

Whenever possible research should proceed from a hypothesis, for without hypothesis an investigation is relatively aimless search for data of vague relevance and significance. Hypothesis is particularly necessary in the search for cause-and-effect relationship. In such, the presence of certain characteristics do suggest correlation between variables. It gives direction to the enquiry thereby enabling the researcher to give a right focus to the study without resorting to rule of thumb or trial and error method. It also helps the researcher to collect the specific data without wasting the time and resources. Finally, as the hypothesis is pointed and specific, appropriate and specific inferences can be drawn. As Goode and Hatt put it without hypothesis study becomes unfocused, a random 'empirical wondering'.

Hypotheses are least crucial in studies in which the task is determining the status of a given phenomenon, although even in such studies the investigator is likely to need some tentative hypothesis to guide him to the areas worth exploring. However, hypotheses are not essential to research, particularly in the early stages of exploration of a problem. Failure to have a hypothesis is not necessarily a sign of a lack of scientific sophistication. Bacon felt that hypothesis biases the investigator towards a position and causes him to lose objectivity. This need not be so; a hypothesis must be conceived as an assumption which merits consideration, not as position to be defended. Furthermore the scientific method puts such restrictions on the investigator that the extent to which he can distort evidence to fit his personal views is minimal.

Hypothesis provides direction to research and prevents the review of irrelevant literature and the collection of useless or excess data. Hypothesis not only prevents waste in the collection of the data, but they also ensure the collection of data necessary to answer the question posed in the statement of the problem. Hypothesis sensitises investigator to certain aspects of the situation which are relevant from the standpoint of the problem at hand. In general the hypotheses spells the difference between precision and haphazardness between fruitful and fruitless research.

Hypothesis permits the investigator to understand with greater clarity the problem and its ramifications as well as the data which bear on it. They enable him to identify the procedures and methods to be used in solving his problems and rule out methods which are incapable of providing the data necessary to test the hypothesis. Hypothesis also acts as a framework for the conclusions, direct answer to the hypotheses being tested.

Hypotheses are of different types of forms. There are hypotheses stating relationships (e.g., as cinema spreads, the crime rate increases); some specify functions (e.g., industrialisation results in urbanisation; and thirdly null hypotheses which study the existence of no relationship between variables. Goode and Hatt classified the hypothesis on the basis of the level of abstraction. Based on this they identified the following three types of hypothesis:

1. Hypothesis that states existence of empirical uniformity,
2. Those concerned with complex ideal type, and
3. Those concerned with the relation of analytic variables.

Hypothesis can be formulated from different sources viz., experience of the researcher; from the review of literature; from the findings of the pilot study; from analysis testing the validity or otherwise of the existing theory; from the creative thinking and imagination of the researcher. As Goode and Hatt observed that general culture of the society has a great influence on the thinking process. As such hypothesis can be generated from hunch, intuition, folk wisdom, cultural patterns or metaphysical backs. Similarly, study and analysis of deviant cases also provides basis for formulating hypothesis. These are only some illustrative sources for generating hypothesis and by no means exhaustive. The researcher depending upon the context should identify his own sources and formulate the hypothesis.

Criteria for judging hypothesis

Merit of a hypothesis can be judged only by its effectiveness. Nevertheless we can set a general criteria for judging the effectiveness of hypothesis.

A good hypothesis must be based directly on existing data. It might even be expected to predict or anticipate previously unknown data. It must explain existing data in simpler terms and as concisely as possible. A good hypothesis must above all, be testable.

Goode and Hatt suggest the following characteristics of a useful hypothesis:

1. Must be conceptually clear;
2. Should have empirical reference;
3. Must be specific;
4. Should be related to available techniques; and
5. Should be related to a body of theory.

Some assert that hypothesis may be stated as a question though there is no general consensus on this view. It can be stated in a

question form or in the form of a declaration of statement or in the form of a directional statement or in a null form.

There are several problems in formulating the hypothesis. The chief difficulties according to Goode and Hatt are:

1. Absence of a clear theoretical framework;
2. Lack of ability to utilise that theoretical framework logically;
3. Failure to be acquainted with available research techniques so as to be able to phrase the hypothesis properly.

After the formulation of hypothesis the researcher should collect the data by choosing the appropriate tools and analyse the data based on the requirements. The data, so collected, may support the hypothesis or disprove the hypothesis.

The formulation of problem thus involves several steps like choosing the broad area of the research, identifying the research problem within the broad area and finally formulation of a hypothesis.

9

Research Design

K. Ravi Chandra

Research design has been defined by different social scientists in different terms. All these definitions emphasise systematic methodology in collecting accurate information for interpretation with economy in procedure. To mention a few definitions, Miller has defined "Designed research" as "the planned sequence of the entire process involved in conducting a research study." According to Selltitz and others, "Research design is a catalogue of the various phases and facts relating to the formulation of a research effort. It is an arrangement of the essential conditions for collection and analysis of data in a form that aims to combine relevance to research purpose with economy in the procedure."

A few other definitions of research design are: "A research design designates the logical manner in which individuals or other units are compared and analysed, it is the basis of making interpretations from the data."

"The challenge of a research design is to translate the general scientific model into a practical research operation. Research design will refer to the entire process of planning and carrying out a research study."

"Research design is the plan, structure and strategy of investigation conceived so as to obtain answers to research questions and control variance."

Before considering the characteristics and the components of a good research design, it may be mentioned here that any mode of research—descriptive, explorative, experimental, evaluative, diagnostic, prognostic—incorporates all the essential components of a research design but more importance is given to certain aspects of a research design in a particular type of research compared to the other.

I. CHARACTERISTICS OF A GOOD RESEARCH DESIGN

The designing aspect of a research study especially in the field of social sciences is very complex. The selection of a method or

methods of logic and the planning of the design in time do not guarantee sound results. These are only first steps. The research design at the most, is a blue-print, and therefore at best it is only tentative. It is definitely useful to the extent of laying down a series of guide posts to keep one headed in the right direction.

Every design has its own strengths and weaknesses and at the same time there is no such thing as a single correct design. A good research design should satisfy the following four conditions: objectivity, reliability, validity and generalisability of the findings.

(a) *Objectivity*: The objectivity of the findings pertains to the methods of collection of data and scoring of the responses. The objectivity of the procedure (either collection of data or scoring of the responses or both) may be judged by the degree of agreement between the final scores assigned to different individuals by more than one independent observer. The more 'subjective' the observation, recording and evaluation of the responses, the less the different observers agree.

The investigators who use closed ended questionnaires (questionnaires in which each item is supplied with certain alternatives thus forcing the respondent to choose one among them) are said to be collecting data with the help of objective tools because all the scorers can apply a scoring key and agree perfectly on the result. In contrast, the open ended questionnaires (questionnaires in which the respondents are allowed to give free responses to each of the items) allow room for great disagreement among the scorers. However in certain instances, the questionnaires consisting of both the types of items are used purposefully. In such instances free response items and observations can be made fairly objective by giving careful instructions and guidelines to the observer or scorer.

Thus any research design should permit the use of measuring instruments which are fairly objective in which every observer or judge seeing a performance arrives at precisely the same report. This ensures the objectivity of the collected data which will be used for the analysis, inferences and generalisations.

(b) *Reliability*: Reliability refers to 'consistency' throughout a series of measurements. That is to say, if a respondent gives out a response to a particular item, he is expected to give the same response to that item whenever he is asked subsequently. On the contrary if the respondent keeps on changing his responses to the same item when he is asked repeatedly, then the investigator will be facing a difficulty in considering which one of these responses is the genuine response of the respondent. So, the investigator should frame his items in such a way that the respondent cannot but give only one genuine response. There are different methods in determining the reliability of the responses given out by a respondent. Some of these methods are: using 'check items', administering the same test repeatedly; using a series of 'parallel' forms etc.

(c) *Validity*: Any measuring instrument is said to be valid when it measures what it purports to measure. For example, an intelligence test, constructed for measuring intelligence should measure only intelligence and nothing else. As in the case of reliability, there are a good number of procedures for establishing the validity of test. Some such procedures are: validating the present data against a 'concurrent' criterion or a future criterion or a theory etc.

(d) *Generalisation*: Once it is ensured that the measuring instruments used in a research investigation yield objective, reliable and valid data, the next important problem, a well planned research design has to answer is the 'generalisability' of the findings of the present study. That is how best the data collected from a sample can be utilised for drawing certain generalisations, applicable to a larger group (population) from which the sample is drawn. In other words, with how much authority and confidence, an investigator can say that the same findings will be obtained even though the data is collected from the total population from which the sample is selected. A research design, thus helps an investigator in his attempt to generalise the findings, provided he has taken due care in defining the population, selecting the sample and using the appropriate statistical analysis while planning his research design. Thus a good research design should ensure that (i) the measuring instruments can yield objective, reliable and valid data, (ii) the 'population' is defined in unequivocal terms, (iii) the requisite size of the sample is collected by using the most appropriate technique of sample selection, (iv) the appropriate statistical analysis has been employed, and (v) the findings of the present study can be 'generalised' without being contaminated by the errors of measurement or sampling errors or any other interfering factors.

II. COMPONENTS OF A RESEARCH DESIGN

Any investigator, before getting on to the job of planning a research design for a proposed study, should be clear about the following aspects:

- (a) What to observe?
- (b) Whom to observe?
- (c) How to observe?
- (d) Why to observe?
- (e) How to record the observations?
- (f) How to analyse the observations?
- (g) What inferences can be drawn?

Once the investigator has sufficient understanding about the above mentioned aspects, he can resort to the job of planning a

research design. In doing so he proceeds step by step in the following order:

- (1) Title of the investigation
- (2) Purpose of the study
- (3) Critical appraisal of previous studies
- (4) Statement of the problem
- (5) Scope of the investigation
- (6) Objectives of the study
- (7) Conceptualisation of the terms used in the investigation
- (8) Variables
- (9) Formulation of hypotheses
- (10) Selection of the sample
- (11) Data collection
- (12) Analysis of the data
- (13) Tabulation of the results
- (14) Interpretation of the results
- (15) Verification of the results
- (16) Conclusions
- (17) Suggestions for further research
- (18) Bibliography
- (19) Summary of the report.

To deal with each one of the above aspects at length is rather unwarranted at this stage as the following chapters deal with some of the above aspects quite in detail. Thus the author feels that only such aspects not covered in any other chapter in this book and also some of the important aspects should be given a wider coverage in this chapter while explaining the different components of the research design.

1. Title of the Investigation

The title of any research project:

- (a) Should be as brief as possible.
- (b) Should be as precise as possible.
- (c) Should project the scope of the problem in generalised terms.

2. Purpose of the Study

A brief mention of the importance of the area of research in the present context of social life should be attempted highlighting the main purpose which prompted the investigator to take up the present study.

3. Critical Appraisal of Previous Studies

Eventhough this aspect represents the major portion of explorative studies, this aspect is crucial even for other kinds of research. Usually, investigators are habituated to report as many studies as possible, conducted in their respective areas of interest and abruptly state their problem. This type of review only amounts to abstracting different studies at one place and nothing more than that. Does this actually serve the purpose for which the review has been made? The answer to this question is a definite 'No'. Then, let us answer the question "Why should the investigator review previous studies?" The answer to this question is to critically examine the following:

- (a) To know about the different areas covered by various studies in the field of investigation in which the investigator is interested and to categorise them accordingly.
- (b) To get acquainted with the different meanings given to certain concepts and the usage of different concepts in various studies and arrive at the meanings of different concepts used in the present study.
- (c) To concentrate on the areas where little research has been carried out and to give less importance to the areas which have already been thoroughly investigated while delimiting the scope of the present study.
- (d) To look into different merits and shortcomings of the research designs followed in different studies with a purpose to retain the merits of different studies and cover up the loopholes while designing the plan of research for the present study.
- (e) Finally, to verify the present findings with the previous findings discussing the results of the present study.

Thus, instead of reviewing previous studies for the sake of doing it; critical appraisal of previous studies is more meaningful, useful and a correct approach in any field of investigation.

4. Statement of the Problem

Once the investigator is able to collect different studies conducted in his field of investigation from various sources and examine

each one of them critically for the points mentioned above, he will be in a position to state his problem in unambiguous and more precise terms. Usually the problem of investigation is stated in two ways—(a) in the form of a statement or (b) in question form. In some cases the problem is stated with the help of more than one statement or a question.

5. Scope of the Investigation

The scope of any investigation is dependent on several factors such as the time and money available to the investigator, availability of the sample, accessibility of the investigator to the respondents, the amount of time the respondents can spare for the investigator etc. Once the scope of the investigation is delimited, the investigator will report the scope in explicit terms while giving out the limitations of his investigation.

6. Objectives of the Study

The investigator will spell out the objectives of the present study in the form of statements and while doing so, he takes care that the objectives mentioned are well within the scope of the investigation envisaged by him.

7. Conceptualisation of the Different Terms Used in the Investigation

The researcher should be clear about the meaning of every term he uses. It not only helps him but also the other investigators, respondents and readers of the research report in understanding the different terms without any ambiguity. Normally these concepts are explained either in the form of nominal definitions or in the form of operational definitions.

Nominal definitions are used in cases where a given word is synonymous with certain other expression, the meanings of which are already established.¹

The second type of definition is *operational definition*. A variable or a concept is said to be operationally defined when the steps in its observation or measurement are clearly stated. Thus an operational definition of a concept helps the investigator in obtaining reliable results, without which he can not establish any fact scientifically which in its turn makes the problem of investigator much more complex in his attempt to accept or refute the hypotheses under consideration with more authenticity.

Sometimes, the investigators even define a variable operationally with the help of items in the questionnaire or interview schedule.

The investigator usually engages himself in the following exercise before arriving at the operational definitions of the different terms.

The investigator will (a) discover the various dimensions involved within the concept, (b) correlate these different dimensions so that all possible types can be discerned, (c) reduce the number of types to be studied, (d) translate those types selected for study into operational categories and empirical indices.

It is always advisable to define each concept both (i) in abstract terms giving the general meaning it intends to convey and (ii) in terms of operational categories by which it is represented in a particular study.

8. Variables

The word variable refers to an event or process that can be changed or can change on its own accord. The variables are classified in several ways. A few of them are mentioned below:

Classification No. 1: Among the characteristics, events and processes attributable to people, the variables can be categorised into two groups viz., *Absolute properties* and *Relative properties*.

Absolute properties are those the possession or occurrence of which can be attributed to an individual in such a way that their meaning does not imply any reference to the properties of other persons or objects. For example demographic factors, behaviour of people isolated from social context; psychological traits of the individual taken as being self-contained and not as elements of social relation.

Relative properties are those whose meaning assumes some type of relationship between the person or object, about which we are stating something, and some other objects or people.

Lazarsfeld and Menzel classified the relative traits into the following three categories:

(a) *The comparative properties of individuals* i.e., those which consist in attributing a certain property to someone as a result of comparison of this person with a group of people or with some other standard of reference e.g., eldest person in the group, class pupil leader etc.

(b) *The relational properties of individuals* i.e., such properties which define individual as a participant in a particular social relation for example as someone who performs a certain social role in his group or occupies a particular socially determined position etc. e.g., teacher and pupil; owner and tenant etc.

(c) The third category of relative features is *contextual features*. When we assert that someone is a member of a strongly integrated group, we characterise the member only by giving his social context. We say for e.g., that X lives in a locality in which 90 per cent of the inhabitants are religious. The believers (90 per cent) and

non-believers (10 per cent) in this group have the same contextual feature, that of being members of the group, the overwhelming majority of which are religious.

Classification No. 2: The variables can be categorised into qualitative and quantitative variables.

Qualitative variables are usually discrete in their nature. For example sex, methods of teaching etc.

Quantitative variables are usually continuous in their nature and are broadly categorised into four types—the nominal, ordinal, interval and ratio variables.

(a) *Nominal variables* (i.e., variables measured by nominal scales). Nominal variables make it possible to establish relations of equality or diversity for any pair of objects but they do not enable us to ascertain that one object belonging to a particular group has a given feature in a higher degree than another object belonging to the same group, e.g., Indians, Osmania University players group i and group ii etc.

(b) *Ordinal or ranking variables:* These variables enable us to state whether two objects, compared from a given point of view, possess a given property to the same degree or whether one has it to a higher degree. However in the latter case it is not possible to specify what the exact distance between those objects on the scale of a given property is, e.g., if x, y and z got 1st, 2nd and 3rd ranks respectively in general knowledge test, this does not mean the difference in marks obtained by x and y is same as the difference in marks obtained by y and z.

(c) *Interval variables:* These variables make it possible to establish by how much one of the two objects possesses a given feature in greater measure than the other. However interval variables does not permit to determine, how many times a given object has a given feature to a more intensive degree, e.g., calendar time, temperature scale where an arbitrary zero has been set by convention.

(d) The last category of variables consists of *ratio variables*, i.e., those attributing a certain absolute value of intensity to a certain variable, thus permitting comparison not only of the distances between different values but also the ratio between them, e.g., speed of a vehicle, when expressed in terms of KMPH, the speed has an absolute zero value if the vehicle is immobile.

Here it may be mentioned that variables of a higher order can always be changed into variables of a lower order, but not conversely. Thus the conversion is possible only in one direction i.e., from ratio variables to interval variables to ordinal variables to nominal variables but not in the reverse direction.

Classification No. 3: In experimental research the following terminology is commonly used—*independent variables*, *dependent variables* and *interfering variables*.

Independent variables are those variables which are manipulated by the experimenter in his attempt to ascertain their relationships to an observed phenomenon. Independent variables are also known as stimulus variables and antecedent variables.

Dependent variables or response variables or consequent variables are those events which are hypothesised as dependent on the changes in the independent variables.

Interfering variables or mediating variables or intervening variables are those variables which distort the relationship between the independent and the dependent variables. Thus, in order to obtain the real relationship between the independent and dependent variables, the influence of the intervening variables is to be controlled. The experimental control of these mediating variables is a crucial step in designing experimental research. The different methods of experimental control are (a) method of removal or elimination, (b) method of constancy of conditions, (c) the control group method, (d) matching method, (e) counter balancing method etc.

9. Formulation of Hypothesis

A tentative solution suggested to a problem is called a hypothesis. McGuigan (1969) has defined hypothesis as a testable statement of a potential relationship between two (or more) variables.

A hypothesis is usually framed depending on one or more of the following sources:

- (a) facts established by previous investigations in the related areas,
- (b) through the investigator's experience and observation, and
- (c) through the investigator's reasoning, insight and logical derivation from a theory.

For any reason, if the investigator cannot make use of any of the above sources to frame a hypothesis, he will have to resort to 'Null hypothesis', which assumes 'no relationship' between the variables under consideration.

McGuigan suggested the following criteria to frame a good hypothesis.

1. The hypothesis must be an adequate answer to the specific problem that demanded an answer.

2. The hypothesis should have logical simplicity.
3. The hypothesis should be expressed in a quantified form or be susceptible to convenient quantification.
4. The hypothesis must be verifiable.
5. The hypothesis must be stated in such a way as to allow it to be refuted.

10. Selection of the Sample

It is needless to say that no investigator can study the entire population and hence selects a few individuals belonging to a population for the purpose of his investigation. These selected individuals form a sample and while selecting these individuals the investigator should consider the following facts:

- (a) the definition of the population,
- (b) size of the sample, and
- (c) representativeness of the sample.

(a) *Definition of the population:* The investigator should define population in operational terms, describing it with all the necessary identifiable characteristics. This helps the investigator in selecting the sample depicting the same characteristics with more ease and further helps the investigator in generalising his findings of the present investigation with more authenticity. Thus the only difference between the population and the sample is their size and except for that, the sample is exactly similar to the population in all the characteristics.

(b) *Sample size:* Depending on the mode of research the sample size varies. For example in experimental research the sample size is very small compared to that of descriptive research. It is always advisable to collect data from more number of individuals than required by sample size, to take care of any casualties, particularly in the case of problems where the data is to be collected from the same sample repeatedly at different times. Sample size is usually determined by estimating the reliability of statistics calculated from the data collected from different sizes of the samples.

(c) *Representativeness of the sample:* When a sample is selected, it is assumed that it represents the population for which it stands. Failure of this is failure of entire research study. This is very fundamental and crucial in any research design to give sense to any research study undertaken. Thus the investigator should use his ingenuity in carefully selecting the appropriate technique of sample selection. The different techniques usually employed by the investigators in selecting the sample are random sampling technique, stratified or quota sampling, incidental sampling, purposive sampling, multistage sampling, etc. The reader is advised to refer to the chapter on 'sampling' for further details.

11. Data Collection

(a) *Construction/Adoption of instruments*: The investigator should now find instruments for collecting the data required by the hypotheses. The investigator himself may have to construct these instruments or he may have to adopt the readily available instruments to suit the local conditions. In the latter case, the investigator may make certain necessary changes in the format etc., with the help of the feedback received by conducting a pilot study on a very small sample. However, in the case of the former, it is an arduous task for the investigator. The following are the steps involved in the construction of any test or a questionnaire:

- (1) Operational definition of the variable to be measured.
- (2) Pooling up of a large number of items measuring the variable.
- (3) The type of items or questions to be used—check list, or multiple choice or open ended, etc., is to be decided.
- (4) Review of the items by the experts in the field.
- (5) Pilot study to understand the problems of respondents while answering the test/questionnaire etc., and to know the problems of administration, scoring etc.
- (6) Preliminary try out for the purpose of item analysis which helps in shortening the length of the test by retaining the 'good items' which discriminate fairly the respondents.
- (7) Final try out to establish reliability, validity and if necessary to develop norms for a particular test.

The reader may refer to any book on 'Psychological testing' to get acquainted with the procedures of test construction.

Besides using the instruments, like questionnaires, interview schedules, projective techniques, attitude scales etc., the investigator may adopt other methods like observation, examination of records and so forth for data collection. Each of these various methods has its own advantages and limitations, which will be discussed in detail in the forthcoming chapters.

(b) *Administration of the questionnaires/tests etc.*: Depending on the nature of the questionnaire/test and the purpose of the investigation, the investigator decides whether to administer the questionnaire/test individually or in small groups or in large groups. The administration of the questionnaires etc., is to be carried out systematically i.e., the same procedure regarding the following aspects should be followed on each occasion of administration of the schedules.

- (1) Distribution of the questionnaires among the respondents.

- (2) Instructions to the respondents—sometimes investigators want to give additional instructions over and above the instructions printed on the self-administered questionnaires to make himself sure that the respondents would understand the instructions correctly and also to let the respondents know the precautions to be followed. These additional instructions are also to be standardised and preferably get printed to avoid variation in the instructions from occasion to occasion.
- (3) Collection of the questionnaires from the respondents.

(c) *Scoring and tabulation of the data*: The investigator has to prepare the relevant scoring keys to be used in hand scoring or machine scoring as the case may be. If the data is to be fed into computer for the purpose of analysis, the investigator should also prepare a 'code book' to facilitate easy scoring. In such cases the data will be tabulated as per the details given in 'code book'. During the scoring process, the investigator should scrutinise the incongruities in the respondents' responses and if necessary discard such data where inconsistencies are noticed.

12. Analysis of the Data

Complete planning of analysis in advance is not always possible or even desirable; new ideas occur to the investigator as he collects the data. But, except in exploratory studies, it is always possible and desirable to work out in advance the basic outlines of the analysis. Depending on the nature of the data and the information required by the hypothesis, the investigator should subject the data to appropriate statistical analysis.

13. Tabulation of the Results

Tabulation of the results in a meaningful way is by itself a technique and an art. Each table should be given a suitable heading and followed by a discussion. Recently it has become a practice to give all the tables in a serial order towards the end. It is left to the discretion of the investigator to adopt any one of the above practices as each has its own advantages and disadvantages.

14. Interpretation of the Results

The results of an investigation are to be interpreted:

- (a) in relation to the previous findings,
- (b) for the purpose of generalisation through inductive inference, and
- (c) to uncover any additional factors which could not be visualised by the investigator earlier.

(a) *With reference to previous studies:* The knowledge previously accumulated by the investigator by his earlier review of research will have a great impact on the interpretation of the results. Everything will be alright so long as the present findings confirm the earlier ones. However if the results of the present study contradict the earlier results, then there is every possibility for the investigator to doubt whether his hypothesis is false or if the hypothesis is true, whether he has used faulty indicators for the measurement of the variables. The investigator can overcome the above doubts only if he is very definite that his plan of research is based on sound scientific lines.

(b) *Generalisation:* The investigator can safely generalise findings obtained in his study, provided he has information regarding the (a) definition of the population from which the representative sample is selected, (b) reliability of statistics, (c) level of significance of statistics set by him for testing the hypothesis, keeping in view the interplay of type I and type II errors.

(c) *Looking for unusual cases:* It is customary to test the difference or relationship between two or more variables as significant or not and to interpret the data accordingly. But, at times, deviant cases may reveal additional factors which should be taken into consideration in order to increase the predictive value of the hypothesis. For example one investigator is interested to find out the effect of propaganda on attitude change of a group of villagers. To find a solution to this problem, the investigator used before and after test technique with one experimental group and one control group. When the difference between the means of experimental and control groups are compared with the help of 't' test the obtained result was found to be insignificant and thereby he concluded that propaganda has no effect on attitude change. But a close observation of data revealed that there are some exceptions to it. This leads to an analysis of apparent exceptions whose attitudes were changed. In this particular experiment it so happened that those who had changed are mostly female members and the other group which had not changed comprised male members predominantly. This finding thus yielded additional information which necessitated the reformulation of the hypothesis in the following manner: "The effect of propaganda on the attitude change is likely to be more among women than among men."

15. Verification of Results

The same methods of data collection should be employed on some other small representative sample of the population and the data should be analysed to check whether these results confirm the earlier findings. In case the results are not confirmed on the second occasion, the investigator should think over the loopholes of the research design if any and rectify them in collecting further data.

16. Conclusions

The results for which cross validity is established (i.e., the results verified for the second time) can be used for drawing conclusions.

17. Suggestions for Further Research

No research is an end in itself. The investigator should be able to give directions to the future researchers from the insights he has gained during the investigation.

18. Bibliography

There are different ways of reporting the bibliography. The investigator can select any method he likes but should follow the same procedure throughout. The following order is usually observed by a large number of investigators while reporting the references.

1. Name of the author—the second name is given first and all the references will be arranged according to the alphabetic order of the second names. Some investigators arrange all the references according to the ascending order of years of publication. When two or more authors' names are to be reported for the same article then, except for the first author's name, the other authors' names are to be given in such a way that their first names occur first and then the second names etc.
2. Year of publication: usually this follows the name of the author and is given within the parenthesis. At times the year is given towards the end of the references.
3. (a) Title of the book: Title of the book is usually given in single inverted commas and is followed by the edition number if any.
(b) Title of the article: If an article is to be quoted its title is also given in single or double inverted commas and is followed by the following information:
 - (i) Name of the journal/magazine: The title of the journal or magazine is given.
 - (ii) Volume number: The number of the volume is given in Roman numerals like V for 5, X for 10 etc.
 - (iii) Number of the journal: Number of the journal is given within the parentheses.
4. Page numbers referred: Wherever there is possibility, the page numbers referred by the investigator are given. Usually it is indicated as follows—PP 20-30. This means the investigator has referred to pages from 20 to 30 in that journal or book and for large numbers, the common practice is to

represent the second number with only two digits, if it is within the same hundred, e.g. 348-62, 4253-67.

5. Publishers address: The name of the publishers of the book/journal etc., will be given, followed by its place of publication and if possible the full address of the publishers.

19. Summary of the Report

The investigator should give a summary of the entire investigation briefly highlighting the findings of the present investigation and suggestions for the future research.

III. EVALUATION OF THE RESEARCH DESIGN

The fundamental questions in evaluating a research design pertain to the precision, reliability and relevance of the data and their analysis. Before actually carrying out research, it is better if the investigator evaluates his research design. This can be achieved if the investigator verifies the following aspects for their explicitness.

1. How precise are the observations?
2. Can other investigators repeat the observations?
3. How explicit are the hypotheses?
4. Have the problems and hypotheses been stated in operational terms scientifically?
5. Has the plan of research been presented in detail so that its logic is apparent ?
6. Do the data actually satisfy the demands of the problem i.e., do they actually demonstrate the conclusion?
7. Does the research design ensure a comparison that is not subject to the alternative interpretations?

ICSSR prepared guidelines for the formulation of a research proposal to be followed by persons intending to submit research progress to ICSSR. The guidelines are appended to the article.

Appendix

ICSSR GUIDELINES FOR THE FORMULATION OF A RESEARCH PROPOSAL

A research proposal is a sort of a blueprint. Apart from helping the ICSSR to process it quickly, a well conceived research proposal will later also help in its efficient implementation. Every effort made to formulate a proper research proposal will, therefore, pay rich dividends.

Social science research is characterised by a diversity of theoretical perspectives, substantive orientation, methodological strategy, data collection practice and data analysis technique. It is, therefore, not possible to indicate in a short space all the possible ways in which a research proposal can be framed. However, there are certain characteristics that are common to all research proposals. These characteristics are:

- (a) formulation of a problem for research;
- (b) delimiting the boundary of the proposed research and elaboration of its substantive components;
- (c) sources and method of data collection; and
- (d) data analysis.

Given these similar characteristics, individual research proposals will vary greatly in the selection of a researchable problem and the delineation of subsequent steps necessary to complete the research. The selection of a researchable problem depends on the inclination, training and experience of the research scholar. Whatever the problem—and one must take care to see that it is researchable—one of the two primary concerns often underlies a particular research: to know and/or to explain particular aspect(s) of social reality. Whether one is motivated by the former or the latter, will have an important bearing on how the research proposal is developed and designed. The former objective requires a kind of mapping out operation of usually a segment of social reality in respect of certain of its characteristics supposed to be important. If, on the other hand, the purpose is to explain the occurrence of a particular social phenomenon, the emphasis is on why does that particular phenomenon occur and what factors explain its occurrence either in causal or associational terms. It is obvious, then, that these two types of research require entirely different strategies.

Whatever the purpose of research, it is apparent that the selection of essential characteristics for either mapping out a particular aspect of social reality or for explaining its occurrence, requires the placing of the problem and its dimensions in some context.

That context must be provided by the accumulated social science knowledge, on the one hand, and the theoretical position one takes in regard to the problem at hand, on the other. As such, a proper research design must start out with formulating a researchable problem and proceed on to locate it in some theoretical perspective and link it up with whatever social science findings exist in the area of enquiry. An overview of pertinent literature in the area of enquiry, therefore, becomes a crucial component of a research design. The purpose of this overview of literature is not to list the number of published, either all or a few, well known works but to cull out important findings that relate to the substantive concern of the proposed research. This culling out of important findings is necessary for determining the salience of the problem itself on the one hand, and illuminating the theoretical perspective one brings to bear on the problem of research on the other, thereby helping in the cumulation of social science knowledge.

That there is an intimate relationship between the delineation of theoretical perspective and the overview of literature needs no demonstration. Theoretical perspective informs the overview of literature in terms of selection of scholarly works and of findings in order to illustrate their relevance or insufficiency for enquiry into the problem at hand. Whether the delineation of theoretical perspective precedes or follows the overview of literature is a matter of individual preference. However, what must be emphasised here is the necessity of linking up in some meaningful way of the overview of literature and the delineation of theoretical perspective. This is most important since it provides the backdrop for choosing the dimensions that must be explored for a particular enquiry.

Whether it is a descriptive or an explanatory research design, the problem taken up for investigation is invariably rooted in a complex and multifaceted social reality. It is, therefore, necessary to indicate aspects of social reality most relevant for that particular problem. The determination of the appropriate aspects takes its character from the theoretical perspective one adopts. This also describes the boundary of research and provides a basis for ascertaining the nature of data required for the conduct of enquiry.

Usually the determination of the dimensions of a research enterprise is expressed in the language of concepts relating to particular domains of social reality. Since it is a concept or a domain that conjoins theoretical knowledge with empirical reality, it is very important to clearly and precisely define the various concepts or domains proposed to be used in a research project. Also, since a concept or a domain represents an abstraction, the empirical referents that constitute that abstraction must be specified. In other words, the concepts and domains have to be operationalised so that the passage between concepts and their empirical referents is made easy and scientifically valid.

While a descriptive research design need not go beyond the delineation of dimensions and their operationalisation, explanatory research design must provide additional information on how the explanatory exercise is to be carried out. It should, first, indicate clearly the factors with the help of which one proposes to explain a particular phenomenon and second, enumerate hypothesised relationships among variables. In other words, the proposal must furnish an explanatory model containing variables linked with one another by some kind of interaction supposed to be taking place among them. Thus, the determination of independent and dependent variables and formulation of appropriate hypotheses are the essential characteristics of an explanatory research design.

The next step in a research design consists of the specification of the type of data to be collected, the manner in which they are to be collected and the unit to which they pertain. The data to be collected may, depending upon the nature of the problem under investigation, be found almost "ready-made" in various types of secondary sources or it may have to be generated. In the former case, the sources of required data must be indicated. In the case of the latter, construction of some kind of instrument—questionnaire, schedule, etc., for data gathering becomes necessary. In certain cases data have to be collected through interview, observation or the use of informants. In any case the manner in which data are to be collected must be specified. Also, the unit—individual, aggregate or some other entity about which data are to be collected—should be indicated.

In many cases it is just not possible to cover all the cases of a particular phenomenon even though it may seem desirable. The constraints of time and resources impose the necessity of selecting a few cases that may be deemed to be representing the entire class. Sampling then becomes an essential part of certain kinds of research design, the sampling frame, sampling procedure and sample size must be clearly elaborated and an adequate justification provided for the choice. In certain other cases, especially in respect of case studies or exploratory studies, when the focus of study is just one unit, detailed justification for a particular unit must find a place in the proposal.

When requisite data have finally been gathered, the data must be recorded in such a fashion that data processing according to some analysis plan becomes easy. It should be pointed out that data collected for a particular purpose do not exhaust their possibilities when that purpose is served. The data can fruitfully be used by other scholars for secondary analysis. As such, the recording of data must provide for the possibility of re-use by others. This is especially true of quantifiable or quantified data which, when recorded in a machine-readable form, lend themselves easily to re-analysis. It is, therefore, desirable to put these data in machine-readable form. The proposal should also provide for this and indicate the

lines on which data are proposed to be analysed. Specially in the case of an explanatory research design, the analysis plan indicating coding design, the procedure of construction of indices and scales, the use of various statistical techniques for testing the direction and strength of hypothesised relationships, etc., must be included in the research design.

The above discussion suggests that a proper research design should be framed on the basis of the following guidelines which are only illustrative:

I. THE TITLE OF THE PROJECT

II. STATEMENT OF THE PROBLEM

In the opening paragraphs of the research proposal, the problem to be investigated should be stated clearly and briefly. The key questions and the location of the problem in the theoretical context of the concerned discipline should be specified. The significance of the problem, the contribution which the proposed study is expected to make to theory and methodology as well as its practical import, and national relevance should be specifically indicated.

III. OVERVIEW OF LITERATURE

Summarising the current status of research in the area, including major findings, the project proposal should clearly demonstrate the relevance or insufficiency of the findings or approaches for the investigation of the problem at hand.

IV. THE CONCEPTUAL FRAMEWORK

Given the problem and the theoretical perspective for investigating the problem, the proposal should clearly indicate the concepts to be used and demonstrate their relevance for the study. It should further specify the dimensions of empirical reality that need to be explored for investigating the problem.

V. RESEARCH QUESTIONS OR HYPOTHESES.

Given the conceptual framework and the specification of dimensions, the specific questions to be answered through the proposed research should be sharply formulated. In the case of an explanatory research design, specification of variables and posting of relationships among them through specific hypotheses must form a part of the research proposal.

VI. COVERAGE

If in the light of the questions raised or the hypotheses proposed to be tested, sampling becomes necessary, full information on the following points should be given:

- (1) Universe of study.
- (2) Sampling frame.
- (3) Sampling procedure.
- (4) Units of observation and sampling size.

If the study requires any control groups, these should be specifically mentioned. An explanation of the determination of size and type of sample will also be necessary. Proposals not requiring a sample selection should specify their strategy appropriately and describe the rationale.

VII. DATA COLLECTION

The different types of data that are proposed to be gathered should be specifically mentioned.

The sources for each type of data and the tools and techniques that will be used for collecting different types of data should be specified.

For questionnaire or schedule to be used, the following should be indicated:

- (1) Distribution of questionnaire or schedule in different sections, e.g. identification data, socio-economic data, questions on various sub-themes.
- (2) Approximate number of questions to be asked from each respondent.
- (3) Any scaling techniques to be included in the instrument.
- (4) Any projective tests incorporated in the questionnaire/schedule.
- (5) Approximate time needed per interview.
- (6) Any plans for index-construction.
- (7) Coding plan (Whether the questions and responses will be pre-coded or not; whether the coding is done for computer, or for hand tabulation).

For interviews, the following details should be given:

- (1) How they are to be conducted (free associational, non-directive, focussed, direct or on telephone).

- (2) Particular characteristics that interviews must have.

For the use of observation techniques, describe:

- (1) The type of observation: participant, quasi-participant, non-participant.
- (2) Units of observation.
- (3) Whether this will be the only technique or whether other techniques will also be employed.

VIII. DATA PROCESSING

The manner in which the different types of data will be processed, the tabulation plan and the types of data that will be processed through the computer should be explained in detail.

IX. TIME BUDGETING

The object should be broken up in suitable stages and the time required for the completion of each stage of work should be specified. For instance, such stages may cover:

- (1) Preparatory work, including selection and appointment of staff and their training.
- (2) Pilot study, if any.
- (3) Drawing of sample.
- (4) Tool construction (including their pre-testing and printing).
- (5) Data collection.
- (6) Data processing (which should include coding, editing, punching, verification, storing, computer analysis).
- (7) Data analysis.
- (8) Report writing.

X. ORGANISATIONAL FRAMEWORK

An organisational chart indicating the position, tasks, and number of persons, their level of qualifications/training required to fill the different positions should be given.

XI. COST ESTIMATION

The cost of the project is to be estimated in terms of total man-months and the facilities needed. Calculate it under the following headings:

<i>Position</i>	<i>No. of Persons</i>	<i>Salary (including allowances, etc.)</i>	<i>Duration</i>	<i>Amount Required</i>
(1) Personnel.				
(2) Travel.				
(3) Data processing.				
(4) Stationery and printing.				
(5) Equipment (total expenditure should not exceed 5 per cent of the total budget).				
(6) Books, journals, etc. (expenditure not to exceed 5 per cent of the total).				
(7) Contingency expenses, including postage.				
(8) Any other (specify).				
(9) Overhead charges 5 per cent of the cost (i.e. of the sum of items 1 through 8, where applicable).				
(10) Grand total.				

While suggesting budget estimates for the research proposal the project director should take into account the time budget, as well as various steps involved in the conduct of the research proposal.

The rationale for the allocation of time and money for the various items of budget estimates must be furnished.

Types of Research Design: Descriptive and Diagnostic

P. Sandeep

A research design is a plan according to which observations are made and data assembled. It provides the empirical and logical basis for drawing conclusions and gaining knowledge.

There are different kinds of research designs. They vary from general and sketchy statements of intent to carefully detailed and highly complex investigations. The research designs can be divided into four types, viz., descriptive, diagnostic, exploratory and experimental.

Description is what we do when we try to answer the question; what is the state of affairs as it exists? Although description of an activity is essential it is not sufficient merely to explain the activity, event or phenomenon. Scientific explanation about the relationships among interactivity or isolating components of an activity or event is needed. This is accomplished through diagnostic research. In addition, we have experimental designs which permit us to make fairly safe inferences about the relationships among the variables and to assess the contributions that each variable singly or in combination with others, makes to the total experimental outcome. There are also exploratory designs.

Whichever type of research design the investigator selects, it is important that he should have a research design and the design should be made explicit before the research begins. The quality of results and the degree of confidence that the researcher can place in the causal inferences derived, depends upon the design according to which the data were collected. It is important for the social scientist to know the uses and the strengths and weaknesses of each type of research design, for it is vital to understanding and doing effective research. In this chapter we shall discuss the descriptive and diagnostic designs and the following chapter is devoted to a discussion of explorative and diagnostic designs.

I. DESCRIPTIVE DESIGN

The descriptive research designs enable researchers to describe or present picture of a phenomenon or phenomena under investigation.

The methodology involved in such designs is mostly qualitative in nature producing descriptive data, i.e., people's own written or spoken words and observable behaviour. There are at least three such approaches which enable us to record or analyse the behavioural patterns: A. Participant Observation; B. Personal Documents; and C. Unstructured Interviewing.

A. Participant Observation

Participant observation refers to research characterised by a period of intense social interaction between the researcher and the subjects, in the milieu of the subjects. During this period, data are unobtrusively and systematically collected.

Participant observation as a research design has three stages: 1. Pre-Field Work; 2. Field Work, and 3. Data Analysis.

Pre-Field Work: Usually all researchers have some general questions in mind when they enter the field. These typically fall into one of two broad categories: one substantive and the other theoretical. The first includes questions related to specific substantive issues in a specific setting. The second category of interests is more closely tied to basic sociological problems and broader theoretical issues. These two categories are interrelated. What distinguishes participant observation and all qualitative methods from other methods is that the participant observer's questions are framed in general terms. To enter a setting with a set of specific hypotheses is to impose preconceptions and perhaps misconceptions on the setting.

Any setting that meets the substantive and theoretical interests of the researcher and that is open for study might be chosen as a research site. The researchers should choose settings in which the subjects are strangers to them and in which they have no particular professional knowledge of expertise.

There are no hard and fast rules for the participant observer. Research in the field will always involve the researcher in a great deal of soul-searching and negotiation. Detailed field notes should be kept during the process of gaining access to any setting.

The pre-field work consists of decisions that the observers must make before they enter the field and initial contacts they must make to conduct their research.

Field Work: For doing a meaningful field work skill in the area is a prerequisite. Usually in the first days of the field work, researchers remain relatively passive throughout the course. A good rule to follow in the initial stage of the field work is not to challenge the behavior or statements of the subjects or to ask questions that are likely to put them on the defensive. They have to be exposed to their subjects so that the subjects can become familiar with them, develop trust in them and feel at ease in their presence.

It is important for researchers to select their own places and times to observe. They must be able to observe the setting on all days and at all hours of the day. Observers must conduct themselves in such a way that the events that occur during their observation do not significantly differ from those which occur in their absence. It is essential for researchers to win the trust and confidence of their subjects, that is to establish rapport with them. The goal of researchers is to blend into the setting they observe.

Probably the easiest way for observers to gain rapport with their subjects is to establish what they have in common with them, i.e., by continuous interaction with the subjects, they must feel for themselves as to reciprocate on some level. Another way for observers to establish rapport is to participate in activities with subjects. By experience, observers may learn that the people will not accept until they participate. Of course, they have to limit their participation, until they have gained a feeling for the setting and understanding of how their participation will be received. Finally, observers must be careful not to disrupt their routines. They can establish rapport with their subjects if they adhere to their routines. Racial or social class differences also may divide the observer and subject. However, the researcher should hold back from close relationships with individual subjects until they have a good grasp of the nature of relationships in the setting.

The observer must remember that his or her primary purpose is to collect data. Any participation that interferes with the ability to do so should be avoided. In addition to the level of participation, language is another important aspect. The words and symbols that are used by the researcher must have the same meanings in the world of their subjects. In certain settings, people also require a special vocabulary to build lines of action in those settings.

Before entering the field, the researcher must have some broad questions in mind and allow themes and information to emerge before pursuing their own areas of inquiry. In other words, observers should ask questions in such a way as to enable the subjects to tell about what is on their minds and what is of concern to them without forcing them to respond to the observers' interests, concerns or perceptions. As the research progresses, the observer can alter the strategy used to elicit information. Once themes, concerns and perspectives have emerged from the settings, observers can begin to explore specific hypotheses.

After each observation period, field notes should be recorded. Observers must develop a level of concentration sufficient to enable them to commit to memory, every thing they see, hear, smell, think and so on. After they have left the field, they must transcribe what is in their memories on to tapes, which are later typed or directly on to paper.

Although each observer will use a different form, for purposes of clarity and for easy data retrieval, researchers should adopt a standard form for their field notes:

1. Note such information as the data, time, place of observation and the date and time the notes were recorded.
2. Number each of the movements in the setting and indicate the page of the notes on which that movement is described. This will serve as an easy reference to check specific events and will provide readers with a useful point of reference.
3. Begin a new paragraph when the topic changes, when a different party enters a conversation and at other appropriate places.
4. Use quotation marks to record as often as possible.

Data Analysis: Data analysis refers to a process which entails an effort to formally identify themes and to construct hypotheses as they are suggested by data and an attempt to demonstrate support for those hypotheses. Data analysis is often a time-consuming and painstaking process. The particular techniques to be followed and the amount of time depend upon the quantity of field notes and the research goals. In a sense, data analysis is an ongoing process in participant observation research which the participant observer explores themes and hypotheses throughout the course of the study, it is during the post-field work stage of the research that he concentrates most on the analysis and interpretation of data.

Once observers have collected what they consider to be sufficient data to understand those aspects of settings in which they are interested they leave the field to engage in a period of intensive analysis. In any case, the observer should begin analysis soon after he has left the field. At this time the data are fresh and exciting. In the intensive analysis stage of the research, the researcher refines his ideas and hypotheses and searches the data for new ones. Although there is no precise formula which will enable the researcher to construct hypotheses and to recognise themes, the following suggestions should be helpful:

1. All the data (field notes, observer's comments, and other materials) should be carefully read. As an added check, someone else can read all of the researcher's data.
2. The important conversation topics should be coded. After the coding process has been completed, the data should be read, sorted and examined for patterns. The themes which were once obscure will be clearly illuminated.
3. Typologies or classification schemes can be useful aids in forming hypotheses and discovering themes. The purpose of

typologies is merely to sensitise to subtle aspects of the setting that may have otherwise overlooked.

4. Literature pertinent to the researcher's interests and research setting must be read thoroughly. After and during the intensive observation stage, the observer should consult professional literature. He should also utilise the concepts, models, paradigms of others. They will help him to formulate hypotheses and to put things in perspective. Finally, what one sees, hypothesises and subsequently reports depends upon one's theoretical assumptions.

After the formulation of hypotheses, the researcher should turn to an analysis of the extent to which they are supported by data and the conditions under which they hold true. The exact number of hypotheses the researcher seeks to analyse will depend upon the quality and quantity of the data and his or her own interests and goals. Some of the ways in which participant observers can analyse and increase their understanding of their data may be mentioned.

1. Once the observer has coded and sorted the data by hypothesis he should examine the extent to which the items in each coded category support the respective hypothesis. The only valid advice to offer is that the researcher should be able to state his degree of confidence in each hypothesis in the write up of findings.

2. It is important that the observer scrutinises and compares solicited statements, responses to questions or remarks, with unsolicited or volunteered statements. While solicited and unsolicited statements should be treated differently they are equally valuable.

3. Researchers can not help but influence the settings they observe when analysing data; he must consider the effect his or her presence had on the setting. Just as the observer influences what a subject may say or do so do other participants of the setting.

Unlike practitioners of most other methodologies, the participant observer seeks merely to demonstrate the plausibility of his hypothesis and not to 'test' or 'prove' them. The latter terms have more meaning in the context of quantitative research models where hypotheses are formulated and examined according to certain formal or statistical procedures.

B. Personal Documents

The phrase "personal documents" is used to refer to an individual's descriptive, first person account of the whole or a part of his or her life or an individual's reflection on a specific event or topic. All personal documents are valuable, however, once the researcher has taken the motivations into account. They may encompass a person's entire life or may focus on a single incidental time period or theme. Differences according to this dimension

usually determine how the materials are used. Personal documents may be presented either on their original form or more likely in edited and recognised version. The author or subject of a personal document may reveal or conceal his or her name from the reading audience. For a number of reasons, it was felt that pseudonyms and fictitious names for researcher induced documents are best to use. More concretely such materials are available in the form of autobiographies, diaries, letters and long open ended interviews that are recorded verbatim.

Process of Collecting Personal Documents: The most effective way to locate personal documents is to place an advertisement in the paper describing the kinds of materials you want and the uses to which they will be put. Some people will be willing to share with the researcher such intimate documents as diaries. By interviewing also one can collect solicited personal documents, i.e., by in depth interviewing for the purpose of constructing autobiographies.

For analysis, personal documents, like participant observation data, can be coded and examined according to themes or the researcher's hypotheses. Of course, matters like the influence of the observer and the presence or absence of others would be irrelevant in the analysis of unsolicited personal documents. However, one caution to be noted would be to examine personal documents in the context in which they were produced. A personal document reflects what one person thinks and feels at one point in time and in one context.

II. DIAGNOSTIC DESIGN

Diagnostic refers to scientific differentiation among various conditions or phenomena for the purpose of accurately classifying these conditions. In its broadest sense diagnosis corresponds to the fact finding aspect of clinical practice. Its objectives include screening and classification, personality description, prediction of outcome and attainment of insight by the client. With regard to both data gathering and interpretation, there are a number of ways in which the services of a skilled clinician are needed. Whether objective diagnostic techniques and statistical prediction formulas can eventually assume the entire diagnostic function remains a moot point.

The diagnostic research paradigm represents the most typical and simple problem-solving strategy of the helper faced with problems and crises on the job. It consists of (1) the emergence of a problem, (2) a diagnosis of its causes, (3) formulation of all the possible avenues of remediation, and (4) recommendations for a possible solution.

Data for diagnosis can be obtained in four major ways: (1) a case history or interview, (2) clinical observation, (3) informal testing, and (4) formal standardised testing.

In general, these four methods are not often accomplished simultaneously. One procedure may suggest the others.

Case Study Method

Case study method is concerned with everything that is significant in the history or development of the case. The purpose is to understand the life cycle, or an important part of the life cycle of an individual unit. This unit may be a person, a family, a group, a social institution, or an entire community. This method probes deeply and intensively, analyses interactions between the factors that produce change or growth. It emphasises the longitudinal or genetic approach showing development over a period of time. In each case the element of typicalness is the focus of attention, with emphasis upon the many factors that characterise the type.

The characteristics of a good case study include an adequate data which is valid, continuous, carefully synthesised, confidential and which should be useful for follow up. An adequate case history clarifies epistemological relationships, resolves controversial points, uncovers illogical thinking, and misinformation and aids in the differentiation between functional and organic complaints.

Interview: The nature of the personal relationship between interviewer and subject requires an expertness and sensibility that might well be called an art. It requires a skilful interviewer to obtain a maximum amount of useful data. The interviewer must try to establish a feeling of mental trust with the persons being interviewed being careful not to ask questions that might alarm them. His attitude should convey a spirit of co-operation, acceptance and empathy while maintaining a degree of professional objectivity to guard against excessive emotional involvement and consequent ineffectiveness.

Clinical Observation: Many attributes are inadequately identified through other standardised test instruments or through interview. The skilful diagnostician should be able to detect through observation or the behaviour and through the proficient use of informal tests. Further informal tests and observation of behaviour provide an opportunity to corroborate findings of the other two areas of assessment. Diagnostic tests provide a microscopic view of the component elements of some area of performance. Such tests enable the diagnostician to analyse the individual's functioning within specific subskill areas and supply direction for remediation. An assessment of the personal adjustment, motor coordination and development can be made by this method.

Formal standardised tests are useful in testing particular aspects of behaviour. They are useful in obtaining information that helps formulate a diagnosis where the tests are widely used. It is important to know the limitations of the test and to use the information in proper perspective. Psychodiagnostics is applied in educational and vocational guidance and in the determination of particular

aptitudes. For problems of aptitude in school work, sport ability (intelligence tests, concentration tests, educational maturity tests etc.) play a substantial part. But they are generally supplemented by personality tests (Projective techniques, Traits, Questionnaires) which differ greatly according to whether the field is criminological, clinical or vocational guidance.

Since the traditional case study approach broadly leads itself to extensive educational experimentation, one must conclude that the research designers expected the diagnostic experts to select or develop reliable and valid group evaluation instruments that would provide "qualitative appraisals" of the critical dimensions. To do this the diagnostic experts would be required to (1) identify the discrete critical abilities, disabilities, needs, styles, temperamental traits, home and community factors, social and personal characteristics; (2) define them in operational terms, (3) explore and select standardized instruments or construct such instruments to measure each of the critical variables in objective terms. For example, differential diagnosis of minimal brain damage by the psychologists calls for focussed observational samplings of behaviour at home, school, play-ground, neighbourhood, and the testing situation. Observational data need to be operationally defined in the critical areas of function; e.g. perceptual, conceptual, languages and behaviour.

Collaborative Diagnosis: Many of the problems which have been attached through field experiment have in fact been problems related to rather highly developed professional skills in such areas as human relations training, therapy, community organisation etc. For such problems there are already available highly skilled professional people who may be called upon to conduct the manipulation. Once the basic role relationships are worked out, there should be a collaborative diagnosis of the situation by the researcher and at least some part of the client organization. The purpose of this diagnosis is to assess various factors that will be involved in executing the research design—the resistances that may be encountered, the dynamics of the situation, in regard to the problem of bringing about a change etc. The ways of going about such a collaborative diagnosis will vary tremendously, depending upon the problem to be studied, the setting, etc., all relevant experiences and information should be used; but whatever the source, a useful diagnosis will have to be formulated in theoretical terms. Because it is necessary to product reactions and to bring about planned changes, the diagnosis must go beyond the mere statement of facts or the labelling of things as "good" or "bad"; it must move toward more causal thinking, for it is only by manipulating its causes that we can vary dependent variable.

The next step should be joint planning based on an adequate diagnosis of the action that must be taken in order to manipulate the independent variable and to control other possibly confounding factors. To be most effective this collaborative planning must go

beyond the point of simply explaining to the client organization what is required in the research.

Among descriptive and diagnostic designs, descriptive research is particularly appropriate in the behavioural sciences; because many types of behaviour that interest the researcher cannot be arranged in a realistic setting. Descriptive research, sometimes known as non-experimental research, deals with the relationships between variables, the testing of hypotheses, and the development of generalization, principles, or theories that have universal validity. It is concerned with functional relationships.

Types of Research Design: Exploratory and Experimental

B.K. Manmohan Singh

Exploratory method

The exploratory method, according to Katz, "represents the earlier stage of science." This significant observation implies that all sciences must have at the beginning had an approach which was purely exploratory. Even as we approach a doctor with an ailment he starts with all sorts of questions, to begin with. From the point of view of the doctor, he is systematically exploring the complaints and is striving to categorise our symptoms. On the basis of this exploration he will arrive at a conclusion, atleast tentatively, about the disease. Only then will he, if necessary, call for a pathological report. All these steps, starting with the exploratory questions will help him to arrive at a correct diagnosis. This example will, while making the meaning of exploration clear, also point out the inevitability and universality of the exploratory approach, which cuts across the barrier of the natural and social sciences. At this stage one may be tempted to conclude that the moment one envisages his study as exploratory, the investigator has absolute freedom for random and aimless activity. The social scientist has freedom to follow interesting leads and to utilize his own ingenuity in obtaining information. Yet the social scientist should exercise judicious temperance in this approach. Man's knowledge of the social sciences has progressed to a degree where social scientists do have some knowledge of "The types of things to look for in most social situations" (Katz 1953).

With this it should be clear that the exploratory study is systematic, scientific, and at times the only way through which a social scientist can check whether an idea, that sounds promising to him has much appeal, if at all, in reality or not. In fact exploratory studies can provide ideas, hypotheses or suggestions that might never occur to a social scientist sitting in an office and meditating over the problem.

The major advantage of the exploratory method lies in its ability to generate many ideas that could be further explored in more controlled conditions, apart from overcoming the most difficult

portion of an inquiry, which is its initiation. It also safeguards social scientist from the possible future embarrassment of having spent a tremendous amount of energy and time and of having squandered the scarce resources. What is more, it will also in the long run save him from rancour for having arrived at results which at best could be described as sterile. Katz goes to the extent of suggesting that even an exploratory study should be so designed as to provide as definite information as possible for a set of research objectives. "In order to attain research objectives" the exploratory method, as suggested by Selltitz et al., should adopt the following steps:

1. Review of related social science and other pertinent literature, one of the simplest ways of economizing effort in an inquiry, is to review the work already done by others. The information thus gathered will serve as leads for further investigation. Careful review of the available material will be helpful in deriving a workable hypotheses with precise meaning. They also suggest important variables for a social scientist.

2. Survey of people who had practical experience with the problem to be studied: Persons by virtue of the nature of their jobs are in a position to throw light on the subject matter of interest to the investigator. Such knowledgeable and experienced persons should not be ignored. "Such specialists acquire, in the routine of their work, a reservoir of experience that could be of tremendous value in helping the social scientist to become aware of the important influences operating in any situation he may be called upon to study". An investigator at the same time should remember that in an experience survey it is a waste of time and effort to interview people who have little competence or little relevant experience or who lack ability to communicate their experiences.

3. The analysis of insight-stimulating examples: Social scientists working in an area which is yet to be explored, which, incidentally is the usual experience of an innovative social scientist, have found the intensive study of the selected samples to be a particularly fruitful method of stimulating insight. For example, remarkable theoretical insights of Sigmund Freud was the result of stimulation provided by his intensive studies of patients. Profound changes in our conception of the relationship between man and society have been brought about largely by intensive anthropological studies of primitive cultures. It will be beneficial for the evoking of insight if the attitude of the investigator is one of alert receptivity, of seeking rather than testing. An investigator should remember that his inquiry is constantly in the process of reformulation and redirection as new information is obtained. Lastly, this approach is characterized by its reliance on integrative powers of the investigator, on his ability to draw together many diverse bits of information into a unified interpretation.

Katz has conceptualised exploratory studies at two levels; the first is the discovery of the significant variable in the situation and the second is the discovery of relationship between variables. It is imperative for the investigator to delimit the area to be studied specially at the first level. Exploratory studies which do not set limits for themselves have limits imposed by various practical matters, some of which may not be realized by the investigator at the formulative stages. The need for exercising some sort of control in collecting or recording respondent's responses will be imminent sooner rather than later. Hence it will help if the investigator, at the formulative stage, is aware of this need for delimiting the problem to be studied. Katz advises that it is much more effective to take one central set of variables and investigate them as thoroughly as possible than try the universe in one piece of research. The investigator may save himself disappointment if he does not look for discernment differences which are perhaps likely to be difficult in exploratory studies. Further they merely lead to insight or hypotheses, but they do not test or demonstrate them. Careful and controlled studies are needed to test whether the hypotheses that emerge out of studies employing the exploratory method have general acceptability and applicability. While discussing the exploratory study as an entity, it is appropriate to consider it as an initial step in a continuous research process. They are undertaken with the explicit purpose of formulating a problem for more precise investigation or for developing a hypotheses.

In conclusion it can be said that no research proposal be aborted for want of methodology, as long as we have the exploratory method. A method which is flexible enough to permit the consideration of many different aspects of a phenomenon. This method attempts to see what there is rather than to predict the relationship that will be found. Mostly the results obtained through the exploratory study are to be treated as a sign post for future and further study in the same or similar direction. For this reason they are also known as formulative studies.

Experimental Method

An experiment in the social sciences is not only different from but also more difficult than an experiment in the natural sciences. A student of natural sciences deals with things that are palpable, tangible and more often than not inert, and consequently more amenable to the rigours of an experiment. The likelihood of an error creeping into an experiment in the natural sciences probably is more due to the person performing the experiment, rather than the substance which is being subjected to the experimental verification. On the other hand, in social sciences, in addition to the danger of an error on the part of the researcher, there is also the difficulty of understanding what is being measured. The phenomena in social sciences may themselves be intrinsic states of the organism, and may have to be measured as inferred properties. Further there

is every likelihood that the substance is less amenable to the rigours of an experiment. The substance in natural sciences remains remarkably alike while in social sciences the substance being human beings differ from one another in their genetic make up, like histories, learned personality characteristics, values and abilities and immediate past experience. In spite of these difficulties as Selltitz et al. observed, "When an experiment is possible it is the most effective method of testing a hypotheses. i.e. one variable 'X' causality influences another variable 'Y'."

The term variable needs some explanation. Technically, a variable is an attribute which can assume different values among the members of a class of subjects or events. The term variable means that which can be varied or changed or that which changes or varies itself. When the experimenter asks a question, he attempts to answer it by manipulation of one or more variables. He wants to discover the precise effect of manipulation. The variable which is manipulated or changed by the experimenter in some systematic way is 'Independent Variable'; it is so called because the experimenter creates it and controls its variation. It is independent of all other causative influences. In an experiment the empirical realisation of the objective of manipulating the independent variable is typically achieved through a set of instructions to subject or an event that happens to the subject. In practice those techniques of manipulating the independent variable are not always separable. They usually blend into each other. Almost always some instructions are involved in an experiment. The investigator must always attempt to make them interesting and forceful. At the same time he must be sure that the subject must understand the instructions. For this reason they should be kept simple. Many a time when an event can possibly be manipulated, then there will be an advantage in the sense that subject will not generally connect, most of the times the event with the experiment. In contrast there are more chances of the subject connecting the instructions with the experiment. This fact increases the possibility of the subject cooperating with the experimenter and give the experimenter good results. The realisation on the part of the subject that he is a subject for an experiment may itself distort the results.

The variable which is measured and which is expected to change as a result of the presence, absence or magnitude of the independent variable is called the dependent variable. The term dependent variable refers to the phenomenon-subject's belief or behaviour etc.—that we attempt to influence with our treatments and that we measure at the end of an experiment. In devising a dependent variable the experimenter seeks to find a measure that will reflect the differences caused by the independent variable. If the independent variable is an effective one, the dependent variable measure will show large differences between the subjects in different conditions rather than in the same conditions. The experimenter should strive to have a dependent variable as straight forward and as easily

measurable as possible. Among other dependent measures often employed are either a behavioural measure or a verbal measure. Verbal measures are easy to use. With a behavioural measure, it is often possible to make the measurement without the subject's awareness. If the subject is unaware of the measure, the problem of reactivity is eliminated. The two basic terms in an experiment, the independent and the dependent variables, indicate which of the two variables is to be treated as cause and which as an effect. Let us for the sake of further clarity take a concrete illustration. It is well known that learning depends in part on whether the learning takes place in small units or all at one gulp. It is not uncommon to find a student who says that he believes in learning in a number of sessions spread over a period of time, say, a month before an examination. In effect he believes in regular work. In contrast there may be another who boasts that he will learn the entire material to be learnt in one night prior to the examination. In effect he believes in learning at one sitting. Which of the two is to be believed? At this stage it will be sufficient, without going into the intricacies of the problem, to assume that it consists of comparing the effectiveness of learning under two different conditions of practice, i.e. spaced or massed, using same or equivalent materials for both conditions.

The method of practice and the amount of learning are the two phenomena in which the experimenter is interested. His plan is to vary the first and observe the subsequent variations in the second. Because the first 'the method of practice' is manipulated by the experimenter, it is known as independent variable. As a consequence of this manipulation of the method of practice, that is distributed over a period of time or all at once, the experimenter expects the amount of learning to differ, which obviously he will measure and which will be the dependent variable. This in brief is the general structure of an experiment in the social sciences: to manipulate one variable and study the effect on another variable, keeping all other variables constant and under control. In other words the ideal of an experiment is to take two identical units and to apply different experimental treatments to them.

With this, perhaps an elaborate background, we are now better equipped to comprehend a traditional definition of an experiment, which according to Judson Mills "is a study in which the investigator manipulates or varies one or more variables (called the independent variables) and measures other variables (called the dependent variables)". In this definition the key terms are the "investigator manipulates" which in itself holds the very essence of an experiment and marks it differently.

A study is an experiment only if the investigator controls a variable in the sense of deliberately varying it. That is manipulating differences in the variable. If he simply measures differences that occur, the study is not an experiment. Admittedly the social scientist is also interested in certain regularly recurring events such

as war, elections, etc. These instances can be studied only when they occur. But they can more profitably be studied by other types of methods in social sciences. It is here that the difference between a study which is experimental and a study which is not is evident. In the words of Hammond and Householder "One of the essential differences between a descriptive or observational study and an experiment lies in the fact that an experiment always involves intervention on the part of the scientist." In spite of the fact that observation is basic to all sciences and for some like Chapin an experiment is simply observation under controlled conditions, one may perhaps find it difficult to equate the two. An observation by Kaplan helps to see the difference in a better light when he remarks that basically experimentation is a process of observation carried out in a situation especially brought about for that purpose. Carlsmith et al. clarify further by their remark that "an experiment differs from other types of scientific investigations in that the experimenter creates the conditions necessary for observation rather than searches for naturally occurring situations." One of the many advantages, to this procedure, which stands out more prominently is that the experimenter has a better chance of studying exactly what is chosen for study. And it is here that the experimental method unequivocally enjoys an advantage over all other methods. They provide proof of casual sequences, while descriptive methods rely mainly on correlation and as is well known correlation does not prove causation.

The term experiment is frequently linked with laboratory. Experimental study and laboratory study are often regarded as synonymous. Postponing the discussion on the subtle differences between them for a later stage in this chapter, at this stage cognizance of advantages which accrue as a result of performing the experiment in a laboratory are focussed upon. By bringing an experiment into a laboratory the investigator in the words of Festinger "is then able to observe and measure the effect of manipulation of the independent variable on the dependent variable in a situation in which the operation of other relevant factors is held to a minimum". The interference of the intervening variables, i.e. the variables which are beyond the control of the experimenter, but nevertheless are likely to effect the dependent variables, is kept to a minimum. The observation of Carlsmith et. al. is pertinent when they state that the experimenter can often exert a great deal of control over extraneous variables and thus ensure that the stimuli in the experimental conditions are similar. In a laboratory experiment one has the opportunity to vary the treatment in a systematic manner, thus allowing for isolation and precise specification of the important differences.

There is another advantage far more important than the ones that have been mentioned so far and it is the random assignment of experimental units (subjects) to experimental conditions. This importance has to be appreciated, because the social scientist is not

always in a position to assign subjects randomly to different conditions. He may often be in the opinion of Sellitz et al. compelled by 'practical circumstances' to "compromise with the ideal of random selection, which invariably impairs the grounds for inferences. If chance determines who gets which treatment, we know that any differences we observe are due to differences in treatment, not to pre-existing differences between the subjects, who were assigned to the various conditions. Thus if the investigator assigns subjects to the experimental conditions at random, as he must if the study is an experiment, then the conditions can differ on other relevant variables only by chance. The possibility that the results are due to chance factors can be considered as ruled out if the differences between the conditions are statistically significant.

In addition the presence of a control group, which is equal in all respects to the experimental group, except that it is not exposed to be assumed casual or independent variable, in contrast to the experimental group, ensures more confidence in the results arrived at by an experiment. The purpose of a control group is to permit comparisons with the results obtained in the experimental group, which will allow the investigator to rule out alternative hypotheses that might account for the results. An experiment may have more than one control group or comparison group because there may be a number of possible alternative explanations that must be ruled out. As a matter of fact an alert experimenter anticipates what possible relevant alternative hypotheses have to be ruled out or their interaction effect to be accounted for. Incidentally the experiment also shows the effect of interaction.

With all the advantages listed above, there is also some criticism. This criticism is more in the nature of exposing certain limitations of the experimental method in social sciences. Perhaps the most common criticism is that the experiment is usually far removed from real life phenomena; in effect it is accused of being an artifact. This is noticed especially against the experiments performed in the laboratory. This objection can be more aptly answered by an analogy. If one wishes to test whether or not a newly designed plane can withstand winds over 2,000 kmph, he does not airborne the plane, along with the passengers to find out. A model of the plane is tested in a wind tunnel in order to predict whether or not the plane will stand the stress. Admittedly the laboratory experiment is an abstraction. The criticism of the experiment being an artifact rather than an abstraction, probably stems from an inaccurate understanding of the purpose of a laboratory experiment. Festinger asserts that a laboratory experiment need not and should not be an attempt to duplicate a real life situation. Perhaps there could be some justification, in spite of the advances made in the social sciences that the experiments are difficult, both at the level of conception and execution. Another frequently levelled charge is that of experimenter's bias, that is, the unintentional influence of the experimenter's behaviour on the

results, in subtle ways. In recent years the investigator has in an effort to avoid the experimenter bias, attempted to replace human experimenter by producing instructions through mechanical means. This incidentally makes him vulnerable on another count, that is these mechanical procedures tend to decrease experimental realism. Another criticism which is more in the nature of a limitation is that some of the independent variables that a social scientist might be interested in investigating are not amenable to manipulation. True, some variables cannot be manipulated for moral, ethical or legal reasons. For example a social scientist interested in studying through an experiment the effect of permanent loss of limb on social interaction, cannot amputate the limb of this subject. In fact no social scientist would want to conduct such a study. Variables in social sciences are measured indirectly by measuring things that are related to the variable, just as temperature is measured by the length of a column of mercury. Most measures in the social sciences are on what is called an ordinal scale, which measures the relative position with no implications as to the absolute distance between two positions. Ordinal scales are more like an elastic tape measure that is being stretched unevenly. The scale positions as indicated by the number on the tape are in a clearly defined order, but the numbers do not provide a definite indication of the distance between any two points. This fact is probably responsible for drawing any conclusions about the exact shape or relationship between the independent and dependent variables. Notwithstanding the above observations, causal relationships can generally be identified with confidence through an experimental approach. In relation to the concept of causality in modern social sciences, the emphasis is on multiplicity of determining conditions rather than on a single condition. Rarely if ever, does the social scientist, expect to find a single factor that is both necessary and sufficient. Rather he is interested in contributory, contingent, alternative conditions all of which he will expect to find operating to make the occurrence of the event probable but not certain. The basic outline of an experiment is simple: an experimental group is exposed to be assumed causal (or independent) variable while a control group is not; the two groups are then compared in terms of assumed effect (or dependent variable). This pattern, according to Sellitz, makes it possible to collect evidence of three major types, relevant to testing a hypothesis about a causal relationship.

1. Evidence of concomitant variation—that is the independent and dependent variables are associated.
2. Evidence that the dependent variable did not occur before the causal variable.
3. Evidence ruling out other factors as possible determining conditions of the dependent variable.

Evidence of the first type—concomitant variation—is provided very simply in an experiment. The investigator knows which subject has been exposed to the assumed causal variables (X)—Experimental group; he measures all subjects in terms of the assumed dependent variable (Y)—Experimental and control groups. He then determines whether Y occurs more frequently among the subjects who have been exposed to X—Experimental group—show greater amount of Y than those who have not—control group or whatever relationship between X and Y is predicted by his hypotheses.

Evidence of the second type—that the assumed effect did not occur before the assumed cause—is secured in one or both of the two ways, by making it reasonable to assume that they i.e., the experimental and control groups, did not differ on the dependent variable before exposure to the independent variable; or by measuring their position on the dependent variable before exposure to the independent variable. If the investigator himself produces the changes in the variable he considers the independent variable, then he can be sure that these changes did not occur after the changes in his dependent variable. He knows that the differences are in the dependent variable because he himself caused the differences in the independent variable.

Evidence of the third type—ruling out other factors as possible determining conditions—may be secured in several ways, the major ones being:

1. Factors that have occurred in the past or are relatively enduring characteristics of the subject. The investigator may set up his experimental and control groups in such a way that it is reasonable to assume that they do not differ systematically in terms of characteristics or past experience that might be relevant, or he may measure them before the experiment or he may do both.
2. In attempting to rule out contemporaneous events other than exposure to the experimental variable as cause of differences in position on the dependent variable, the investigator may arrange for certain conditions to be the same in the experimental and control groups or he may deliberately vary them within the experiment. Sometimes contemporaneous events, which might affect the outcome could neither be held constant nor be amenable to deliberate manipulation. Since such an event affects both i.e. experimental and control groups in the same way, no problem is created, since an effect common to the two groups could not be cause of difference between them in terms of the dependent variable.
3. Whenever an experiment extends over a long period of time, processes of growth and development must be

considered as possible determining conditions of changes. If the said processes are same in both the groups or if it could be assumed that the effect of the experimental variable is not specific to a given stage of development, the effect of maturation can be ruled out by comparison of two groups.

4. The measurement process used in the experiment may itself affect the outcome. Some subjects, at the moment of realisation that they are subjects in an experiment, may like to make what they think is a good impression or occasionally the method itself may suggest responses. In either case, these may distort the experimental results.

The acid test of a social science experiment or for that matter any research lies in its ability to generalize, i.e., the applicability of obtained results in real life. Whenever there is a discrepancy or deviation between the experimental results and the accurate prediction of behaviour, it is known as an error. There is no single step or statement which will maximize the probability of successful generalization but it is well within the ambit of the social scientist to minimize the sources of errors.

Before actually beginning to run the experiment, the investigator must consider various types of errors that might arise, and having identified, should strive to reduce or if possible eliminate them. In social science by their very nature, it is impossible to design an experiment in which no variable except the independent variable affects the outcome. Anything which affects the outcome besides the independent variable is a source of error. Subjects bring personal variables into the experiment. They may be in the nature of their age, background, economic status, intelligence, etc.: variables of such nature are called subject variables. Normal elimination, matching and counterbalancing, are employed to reduce them. Such sources of error are typical since the experimenter can exert no direct control over them. Such errors are of different types viz., constant or systematic and random or variable.

A constant or systematic error is one introduced into the measurement by some factor that systematically affects the character being measured or the process of measurement. Few of the techniques available to the social scientist provide pure measure of such characteristics as intelligence, education and social status, etc. These characteristics are frequently capable of contaminating the results. For example, there is evidence to show that people accept or agree with what they consider as socially desirable. Systematic errors tend to influence all the scores in one condition in the same direction and to have no effect or any different effect on the scores in other conditions. Systematic error, thus can affect the size of difference between the two conditions, thereby distorting the experimenter's source of information about the effects

of the independent variable and possibly vitiating the results of the whole experiment. Therefore, it is important to eliminate such errors.

The random error is due to the more transient aspect of the person. Minor events that occur during particular experimental sessions, and all the extraneous influences on the subject's behaviour which are not controlled by the experimenter and which are equally likely to occur in any of the conditions of the experiment, contribute to this error. If there is an excessive amount of random error in an experiment, a true relationship between independent and dependent variable can be obscured so that the experimenter can erroneously conclude that the variables are unrelated. On the other hand an excessive amount of systematic error, however, can make it look as though two variables are related, when in fact they are not. Thus the experimenter concludes that the hypotheses has been conformed when it has not. Perhaps finding relations, where none exists, because of systematic error is more damaging to the social scientist's quest for generalisations.

One way of eliminating systematic error is to turn it into a random error. Different sources of variability such as subject variables, the experimenter's behaviour, distractions and extraneous events within the experimental setting are not in themselves automatically systematic or random influences. Whether they affect the subject systematically or randomly depends on whether or not certain experimental precautions have been taken. Whatever the reason, anything that results in the over-representation of subjects of a given type in one experimental condition is a potential source of systematic error. If the experimenter has assigned each subject to the experimental or control group at random, however, the error will be a random error.

In general random assignment is one of the experimenter's most important tools. It is so important, in fact, as mentioned earlier, that it is considered as a critical attribute for defining a study as an experiment. The experimenter's goal is to make sure that none of the myriad of extraneous factors which might affect a subject's behaviour in the experiment such as intelligence, is more likely to be associated with one of the experimental conditions than with the other or others. By randomly assigning subjects to conditions, the experimenter can be sure that no subject variable is more likely to occur in one condition than in the other and thus no subject variable is a source of systematic error.

Looking at the random assignment in another way, given that random assignment ensures that all extraneous factors that might influence the subjects behaviour in the experiment are approximately equal in two or more than two conditions, we would expect that if we left out the experimental treatment and run both the groups of subjects as control groups, the average scores of those two groups on the dependent variable measure would be the

same. Of course not every subject will have the same score. Factors other than subject variables can cause systematic error, if they are associated with some conditions more than with others. These may also be eliminated by random assignment. For example if we have more than one experimenter, it is important that each experimenter run about the same number of subject in each condition.

Although random assignment is essential for eliminating systematic error, it cannot reduce the amount of random error in the experiment. A common means of controlling random error is to hold important extraneous variables constant at a single level. The principle behind the technique of holding a variable constant is that the less an extraneous variable is allowed to vary, the less it can affect the dependent variable. Obviously it is never possible to control all sources of random error. That is why, the experimenter must use his judgement in deciding which extraneous dependent variable being measured. Besides holding a variable constant or allowing it to vary at random, the investigator has a third choice, varying it systematically, adding it to the experiment as a second variable. Another advantage of varying more than one independent variable at a time is that this technique can provide information about how one independent variable interacts with another. An interaction is a situation in which the independent variable has different effects, depending on the value of some other variable; if the other variable is also experimentally varied, the data will show the interaction. If it is held constant or allowed to vary at random, information about the interaction may be suppressed.

One often hears about laboratory experiments, field experiments and non-experimental studies. Having come this far, we can certainly note the subtle distinctions among them. Contrary to the popular belief all experimental studies need not be conducted in a laboratory and not all laboratory studies are experiments. A common way of distinguishing laboratory study and a non-laboratory study is in terms of the degree of control over other variables that might influence the dependent variable. In this distinction the word control is used in the sense of preventing them from varying so that they cannot create differences in the dependent variable. Generally laboratory studies are designed to isolate a few variables and examine them with as much precision and control as possible. In the laboratory experiment sufficient control can be achieved to obtain definitive answers, in addition, systematic variation of different factors is possible. Further operation of other relevant factors is held to a minimum. According to Festinger a laboratory experiment may be defined as one in which the investigator creates a situation . . . in which he controls some and manipulates other variables. . . . With a high degree of control and precision in a laboratory experiment we can be more certain than we can in a

field experiment, that the results obtained are due directly to the variables manipulated by the experimenter. The field experiment involves actual manipulation of conditions by the experimenter, in order to determine causal relations in a real existing situation in which the phenomena to be studied are commonly found. By implication it is not an artificial situation, and it will only be reasonable to assume that it lacks the high degree of rigour of a laboratory experiment. While the subjects in a laboratory study think of themselves as subjects, one could probably say that this awareness on the part of subjects as subjects is conspicuous by its absence in a field experiment. Some take the view that the primary scientific advantage of the field experiment is that it permits a more unequivocal determination of causal relations. French is of the view that field experiment permits determining of cause and effect whereas field study would reveal only a correlation.

In spite of the advantages of an experimental study either conducted in a lab or a field at times the investigator is compelled to resort to non-experimental studies. For instance certain variables like social, a class or cultural background, are difficult to manipulate. A social scientist who has a question about these variables is obliged to conduct a non-experimental study. At times the processes operate over a longer period of time than is typically available to the experimenter. Natural processes like language development may require this approach.

Viewed in retrospect experimental approach has not found favour with social scientists, with a few exceptions like psychology. May be because so many of "Key conceptual schemes" in social sciences seem almost "self evident", in light of our experience, and hence not worth the trouble of an experiment. Another erroneous reason pointed out is why demonstrate "common knowledge", through time consuming, elaborate experiments. These comments are made without realising the fact that there are as many false notions as there are correct notions under the popular meaning of the term "common knowledge". Experimentation will help sift correct knowledge from common knowledge. It is Kaplan who goes to the extent of stating that the reason science did not develop further into the cultures of ancient Greece, India and China seems to be traceable at least in part to similar failings in all three. In the experiment it is possible to remove those filters that too frequently come between observer and that which they observe. It is in this context one has to note that prescribing experiments as part of the syllabus has been the accepted method for indoctrinating the culture of science in the student. In the social science many situations, resembling in many respects a human situation of interest can be demonstrated in the laboratory. Experiments of such nature will help the student to understand life around him and also provide an opportunity to think and reason, which incidentally are major benefits derived from any laboratory experiment.

In conclusion, it may be said that the distinguishing features of an experimental method are the deliberate manipulation by the experimenter, the random assignment of subjects and the degree of control exercised. Aronson and Carlsmith have provided an excellent discussion on how experiments are planned and conducted. Their work may profitably be reviewed by those interested in conducting an experiment. But Judson Mills observed that it is impossible to lay down a set of rules that will make some one a good experimenter. Good experimentation is learned primarily by observing good experimentors and doing experiments under their guidance.

Sources of Social Science Information

P. Satyanarayana

M. Yadagiri Reddy

Social scientists must constantly update their knowledge. Knowledge is growing so rapidly that it is becoming increasingly difficult for social scientists to keep track of the contours of increasing knowledge. The most feasible way of updating one's knowledge is to study the published material which is mostly in the form of books and articles. How to identify the books and articles in social sciences? An attempt is made here to answer this question. Sources of information on books, journals and past and present research are briefly described below for the benefit of teachers and researchers in social science subjects in India. The sources described are all Indian.

I. INDIAN BOOKS

India is among the ten largest book producing countries in the world and ranks third after the USA and UK in the production of English titles. India annually produces about 15,000 books. The number of titles produced in India in 1980 was 13,157. Table-1 indicates the annual book production in India during the last decade.

TABLE 1
Annual Book Production in India

<i>Year</i>	<i>Number of Titles</i>
1970-71	18,305
1971-72	17,557
1972-73	17,020
1973-74	17,600
1974-75	16,192
1975-76	21,957
1976-77	21,922
1977-78	19,659
1978-79	18,584
1979-80	16,466

Source: National Library, Calcutta, 1980.

One-third of total production consists of literature followed by Social Sciences, while natural and physical sciences account for a very low per cent. Language-wise, English books occupy the highest position as can be seen from Table-2.

TABLE 2

Book Production by Language in India

<i>Language</i>	<i>Number of Titles</i>
Assamese	101
Bengali	888
English	5,595
Gujarati	724
Hindi	1,379
Kannada	751
Malayalam	772
Marathi	1,292
Oriya	422
Punjabi	308
Sanskrit	20
Tamil	549
Telugu	167
Urdu	27
Total	13,157

Source: National Library, Calcutta, 1980.

The figures 13,157 is an under-estimate as a large number of author publishers, commercial publishers and agencies of Centre and States do not send their publications to National Library, Calcutta, the official Compiler of Indian National Bibliography. There are over 10,000 publishers in the country and of these about 1,300 are author publishers and about 1,000 are government agencies. Table-3 indicates the subject-wise classification of titles produced in 1980.

TABLE 3

Book Production by Category in India

<i>Subject</i>	<i>Number of Titles</i>
1. Generalities	159
2. Philosophy, Psychology	427
3. Religion, theology	773
4. Sociology, statistics	434
5. Politics, economics	1,835
6. Law, Public Administration, Social relief and Welfare, Insurance	818
7. Military art and science	16
8. Education, teaching, training, leisure	276
9. Trade, communication, transport, tourism	234
10. Ethnology, cultural Anthropology	84
11. Mathematics	134
12. Natural sciences	630
13. Medical sciences, public health	176
14. Engineering technology, industries, trades and crafts	1,182
15. Agriculture, forestry, stockbreeding, hunting and fisheries	183
16. Domestic science	60
17. Management Administration and Organization	107
18. Music, performing arts, theatre, film and cinema	103
19. Games and sports	164
20. Language, linguistics, philology	161
21. Literature	4,278
22. Geography	635
23. History, biography	219
Total	13,097

Source: National Library, Calcutta, 1980.

II. MAIN SOURCES OF INFORMATION ON BOOKS

1. **Indian National Bibliography (INB)**

INB has been conceived as an authoritative bibliographical record of current publications in the 15 major languages of India received by the National Library, Calcutta under the provisions of the Delivery of Books Act, 1954. Titles are indicated in vernacular scripts transliterated into roman script. Started as a quarterly in 1957, it is continuing as a monthly since 1964. A 5 year cumulative index (1958-1962) is also available.

2. **Reference Catalogue of Indian Books in Print in English**

An integrated bibliographical tool consisting of three separate but related indexes: Volume I (Title Index), 1,425 pages, 1973. Volume II (Author Index), with the Directory of Publishers in 2 parts, 1,980 pages, 1974. Supplement to Volumes I-II containing books published during 1973-75, 547 pages, 1976. Volume III (Subject Guide), 1,736 pages, 1977.

3. **A Bibliography of English Publications in India (BEPI)**

Bibliography of Indian Books in Print in English arranged in the sequence of author-title-subject index to scholarly and significant publications of the years: 1977 (577 pages), 1978 (586 pages) and 1979 (566 pages).

4. **Indian Books in Print, 1982**

A 3 volume bibliography of 75,000 Indian books in print in English language upto the end of 1981. Volume-I: Authors, Volume-II: Titles, Volume-III: Subject Guide and Directory of Indian Publishers. The 2,400 pages work is compiled by Sher Singh and published by Indian Bibliographical Bureau, Delhi.

5. **National Bibliography of Indian Literature**

A 4 volume publication of Sahitya Akademi, New Delhi covering 60,000 works published during 1901-1953.

6. **Indian Books**

An annual bibliography of 1973-74 compiled by R.G. Prasher in 1974.

7. **Indiana**

A select list of reference and representative books on all aspects of Indian life, and culture edited by B. Sengupta and published by World Press, Calcutta in 1966.

8. (A) **Impex Reference Catalogue of Indian Books, 1960**
(B) **Impex (Supplement, 1960-62) Reference Catalogue of Indian Books, 1962**

9. **Indian Library Literature**

An annotated classified bibliography of books and periodical literature on library science from 1955-1977. It also includes all known Indian bibliographical services and Indian Indexing and Abstracting services and is compiled by R.G. Prasher and published in 1971.

10. **The Library of Congress Accession List, South Asia**

This is formerly the Library of Congress Accession List, India. Since 1981 it is a monthly record of all publications acquired from Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka by US Library of Congress Office in New Delhi and Karachi. The entries in the list are organised by country of publication. Under each country the entries are divided into sections for monographs, serials and special materials.

11. **Select Bibliographies in the Published Books and Unpublished Works, Ph.D. Theses, etc.**

12. **Book Review Columns of Periodicals**

Almost all periodicals in social sciences have book review columns. *Seminar*, *India Quarterly*, *Indian Journal of Public Administration*, *Indian Journal of Political Science*, *Journal of Constitutional and Parliamentary Studies*, *Sociological Bulletin*, are some of the examples.

13. **Book Review Columns of Daily Newspapers**

Sunday editions of almost all newspapers, particularly English ones devote some space for books. Particular mention may be made of *The Hindu* which carries a supplement on Tuesdays in which book reviews occupy considerable space.

14. **Book Publishers' Bulletins and Journals**

All the leading publishing agencies publish periodically bulletins for promoting their trade. *Publishers monthly* by S. Chand, *The Book Maker* by Orient Longman, *Book Selection* by Allied Publishers, *Indian Book Industry* by Sterling Publishers, *New Arrivals* by Jain Book Depot are some of the examples.

15. **Book Distributors' Bulletins and Journals**

UBSPD News Letter, *Publishing in India* are some of the examples.

16. **Book Publishers Organisations' Bulletins and Journals**

An example is *Recent Indian Books*. It is a quarterly journal of Federation of Publishers and Book Sellers Association in India published with the financial assistance from the Ministry of Education and Culture, Government of India.

17. **Book Review Journals**

Indian Book Chronicle, *The Book Review*, *Review Projector (India)*: *The Indian Book Review*, are some of the book review periodicals.

18. **Catalogue of Government of India Publications including Periodicals, 1980**

III. SOURCES OF INFORMATION ON PERIODICALS

1. **ULRICH'S International Periodicals Directory**

The Directory covers about 57,000 periodicals from 160 countries. All the important Indian social science periodicals are included in this.

2. **Current Indian Periodicals in English**

This annotated guide of 6,000 English journals is edited by N.N. Gidwani and K. Navalani.

3. **Indian Periodicals in Print**

A 1973 publication by HND Gandhi, J. Lal and S. Agrawal covering many periodicals in all languages in India.

4. **NIFOR Guide to Indian Periodicals 1955**

5. **Press in India: Annual Report of the Registrar of Newspapers for India**

Part-II of the Report gives a detailed list of papers and periodicals published in India in a year covered by the report.

IV. SOURCES OF INFORMATION ON ARTICLES

A list of articles is technically called an index. An index helps in locating information in periodicals. It is a key to the knowledge present in periodicals. Index is sometimes called by the names of 'Documentation', 'Guide', 'List', 'Bibliography', etc. The important sources for locating periodical articles are indicated below.

1. **Index India**

An outstanding index published from the Rajasthan University library. A quarterly documentation list on India of materials

in English consisting in one sequence Indian Newspaper Index, Index to Indian Periodicals, Index to Foreign Periodicals, Index to Composite Publications, Index to Biographical Profiles, Index to Book Reviews and Index to Theses and Documents.

2. Guide to Indian Periodical Literature

A quarterly from 1964 from Indian Documentation Centre, Gurgaon covering about 300 periodicals with annual cumulations.

3. Indian Press Index

A monthly from April 1968 from Delhi Library Association. It indexes all the signed articles, special write-ups, editorials and important statements and letters published in 25 daily English newspapers of India.

4. Index to Indian Economic Journals

5. Documentation Fortnightly

This is being brought out since 1975 with a view to keep the Members of Parliament well informed of all the important and current materials contained in various documents received by the Parliament Library during the fortnights.

6. Documentation in Public Administration

A quarterly from Indian Institute of Public Administration. It contains index and abstracts of articles besides book notes, index to book reviews, digest of important public documents.

7. Index to Indian Legal Periodicals

8. Manpower Documentation

A quarterly publication of Institute of Applied Manpower Research.

9. Indian Agriculture Index

10. Indian Education Index

A combined retrospective index to 26 Indian journals in education. It is a single authoritative source book of micro literature produced in India during the last three decades. The Index is in two parts—Subject and Author index.

11. Documentation on Foreign Trade

12. Periodicals and their Special Issues

Many periodicals carry select bibliographies of articles and books on select themes periods.

Indian journal of Public Administration (July-September 1977) carried a select bibliography of articles and books on development of backward areas. *Indian Political Science Review* (July 1977 and July 1980) have select bibliographies on 6th and 7th Lok Sabha Elections in India. *Prashasanika* (April-June 1975) included a select bibliography of studies on administrative reforms in India. Each issue of *Seminar* monthly carries a significant select bibliography. So far 284 issues of *Seminar* have been published, it means 284 select bibliographies.

13. Indexes/Documentation Lists/Current Awareness services Regularly Published by Libraries of Universities, Research Institutes, Government Agencies, etc.

Examples: National Institute of Rural Development brings out in mimeographed form (1) *Documentation Bulletin*, (2) *Rural Development Digest*. Administrative Staff College of India brings out *Current Management Literature*. Small Industries Extension Training Institute publishes (1) *Appropriate Technology Documentation Bulletin*, (2) *Sendoc Bulletin: Management and Behavioural Sciences*. Indian Institute of Mass Communication brings out *IIMC Library Current Awareness Service*. Southern Regional Centre of ICSSR brings out *Documentation in Social Sciences*.

Sometimes the agencies running the indexes, lists, etc., bring out their cumulative volumes. Examples:

1. *Cumulative Index to Indian Journal of Public Administration*, Vol. I to XX (1955-1974).
2. *The Library of Congress office Accession list: India: Quinquennial Serials Cumulation*, 1976
3. *Decennial Index to Index India*, 1966-1976.

Cumulative volumes provide quick access to various contributions to journals. They serve as reference aids for the study and research in a particular theme.

14. Special Select Bibliographies/Indexes/Lists prepared by private and public organisations

Several institutions prepare select bibliographies and indexes for the benefit of participants of their training and promotional programmes and other clientele. For instance ICSSR Southern Regional Centre prepared two comprehensive bibliographies on Indian women and Indian Muslims. National Institute of Rural Development prepared a large number of select bibliographies on several themes of training courses, workshops, discussions, etc., organised by it. Institute of Economic Growth prepared *The Bibliography in Urbanisation in India, 1947-1976*. Indian Institute of Public Administration compiled the *Civil Service and Personnel*

Administration: An Annotated Bibliography. SNDT women's University compiled *A Select Bibliography on Indian women.*

V. ABSTRACTS

An abstract provides all pertinent bibliographic details given in an index i.e., author, title, periodicity, publisher, etc. and also provides a brief summary of the important points of the periodical article that is being indexed. It helps to know whether the article in consideration interests us or not and saves the trouble of searching something that may not be of interest or use. Sometimes it is difficult to make a distinction between an index and an abstract. Each of them may give brief gist of articles, reports, books, etc. In a broad sense the abstract need not limit itself to periodical articles; it may cover books, news, official documents, reports, reviews etc. Some of the important abstracts in social sciences available in India are given below:

1. ICSSR Research Abstracts Quarterly

Abstracts of reports of research funded by the Council setting out the objectives, the methodology and the major findings of the research are published in this journal. It was started in October 1971.

2. Indian Dissertation Abstracts

This ICSSR journal publishes synopses of Ph.D. theses in the social sciences submitted to Indian universities. Each synopsis gives the name of the university awarding the degree, the year, and the name of the supervisor. Volume, No. 1 was brought out in March 1973.

3. Indian Psychological Abstracts

This journal publishes short abstracts of research work done in the discipline on Indian themes. It commenced publication as a bi-monthly in January 1972. It is now a quarterly.

4. ICSSR Journal of Abstracts and reviews: Sociology and Social Anthropology

This journal publishes selected reviews of publications in the broad fields indicated in the title of the journal as well as abstracts of research work. It is a half-yearly journal which commenced publication from January-December 1972.

5. ICSSR Journal of Abstracts and Reviews: Economics

Abstracts of select articles in Indian Economic periodicals and reviews of selected books published in English in India are published in this journal.

6. ICSSR Journal of Abstracts and Reviews: Geography

This journal publishes abstracts of research as well as book reviews. It is a half-yearly publication.

7. ICSSR Journal of Abstracts and Reviews: Political Science

This journal publishes abstracts of articles in Political Science published in Indian journals, book reviews and list of reviews published in Political Science Journals.

8. Documentation in Public Administration**9. Current Management Literature****10. Education Abstracts****11. Documentation on Asia**

A series of volumes covering articles and documents on Asia.

12. Indian Behavioural Sciences Abstracts**13. Management Abstracts****14. Asian Social Science Bibliography****15. Abstracts and Index of Reports and Articles**

A digest of significant books, articles, Parliament Reports, etc., published by Lok Sabha Secretariat.

16. Indian Economic Diary

A weekly reference publication presenting an accurate record of important economic events in India. It is a digest of news and features prepared from 50 different Indian Newspapers and periodicals.

17. Asian Recorder**18. Data India**

A weekly record of all significant facts about India's economic and social development. The material is alphabetically arranged under 33 heads.

19. Data Andhra Pradesh

A fortnightly profile on Andhra Pradesh for which material is drawn from newspapers, periodicals, official documents, research publications.

20. Indian Backgrounder**21. Committees and Commissions in India, 1947-73**

A 10 volume digest edited by Virendra Kumar. This covers all the important reports of various Committees and Commissions appointed by Centre and States. This compilation is the only one of its kind.

22. Annual Survey of Indian Law**23. Indian Library Science Abstracts****24. Monthly Abstract of Statistics****25. Statistical Abstract—India Recommendations and Conclusions of Administrative Reforms Commission a compendium****26. Digest of Central Acts****27. Digest of Legislative and Constitutional cases****28. Public Undertakings: Digest of News and Views****29. Diary of Political Events**

S. Nos. 26-29 are publications of Lok Sabha Secretariat, Parliament Library and Reference and Research, Documentation and Information Services. 26 and 27 are quarterly publications while 28 and 29 are monthlies.

VI. SOURCES OF INFORMATION ON RESEARCH ALREADY DONE

1. Doctorates in Social Sciences Awarded by Indian Universities 1857-1967			
2.	„	„	1968
3.	„	„	1969
4.	„	„	1970
5.	„	„	1971

The above 5 volumes have been brought out by ICSSR.

5. **Bibliography of Doctoral Dissertations Accepted by Indian Universities (Social Sciences and Humanities)**

1857-1970	volume
1970-1975	volume
1975-1976	volume
1976-1977	volume
1977-1978	volume
1978-1979	volume
1979-1980	volume

This series is continued by the Association of Indian Universities.

6. **Abstracts of Dissertations in Social Sciences, 1920-1969**

A digest of Ph.D. theses accepted by Aligarh University in some social sciences. It is edited by S.A.H. Haqqi in 1979.

7. **South Indian Studies**

A compilation by B. Rajannan in 1981 of abstracts of dissertations completed in Indian and foreign universities in subjects of South India and Dravidian culture.

8. **Theses on Indian Sub-Continent (1879-1971)**

An annotated bibliography of theses devoted to social sciences and Humanities accepted by the universities of Australia, Canada, Great Britain and Ireland and USA. Krishan Gopal and Dhanpat Rai are respectively the compiler and the editor.

9. **Foreign Theses on India**

A mimeographed publication of Social Science Documentation Centre of ICSSR.

10. **Foreign Behavioural Research on India**

11. **University News**

A fortnightly publication of the Association of Indian Universities which has a column to indicate the particulars of doctoral dissertations accepted by Indian Universities. The information is compiled on the basis of communications received by it from all Universities in India.

12. **ICSSR Surveys of Research in Social Sciences**

Immediately after its establishment, the ICSSR in 1969 initiated a scheme of survey of research done in different social sciences

with a view to identify trends and gaps in research and to determine priorities and select programmes for special promotional effort. The first survey in 1970-71 resulted in the publication of 22 volumes. The second has commenced since 1977.

VII. SOURCES OF INFORMATION ON REFERENCE MATERIALS

There are certain publications which describe the current bibliographies, indexes, abstracts and such other tools of reference for the benefit of social researchers and librarians. They provide quick access to various reference tools of the past and the present. They are time saving devices and reference aids. Some sources of such materials are indicated below:

1. **A guide to Reference Materials in India**
Edited by Gidwani and Navalani, 1975
2. **A Bibliography of Bibliographies**
Edited by Kalia and Jain, 1975
3. **Indian Reference Sources: An Annotated Guide to Indian Reference Books**
Edited by Sharma, Mukherjee and Singh, 1972
4. **Bibliography of Reference Books**
Edited by S. R. Ranganathan and K. M. Sivaraman, 1941
5. **Kothari's World of Reference Works**
By Kothari, 1963

VIII. GOVERNMENT PUBLICATIONS

Government documents constitute a rich data for social research relevant to the socio-economic and politico-administrative development of a country. Government documents are varied and diverse in nature and scope. At the Centre in India, the Controller of Publications and Publications Division are the principal agencies of government publications. In a State, Director of Printing, Stationery and Stores Purchase is generally the publication agency. Government publications are also published by agencies other than the principal agencies of publications. It is extremely difficult to describe all the sources of government publications as there are no known methods to collect and preserve all government publications. The term government publications, in the words of the author of *Government of India Publications*, "may be interpreted to mean the official documents, the thought contents of

which are the direct responsibility of some department or organ of the Government and bears the imprint of a government publishing house and/or indicating Government's responsibility for the accuracy and authenticity of the thought and expressions contained in them."

Most of the government publications remain unidentified and unlocated by the researchers as well as the general public to whom they constitute a rich source of information. There are many reasons for this sorry state of affairs, the main being (1) lack of comprehensive retrospective and current bibliographies exclusively for government publications, (2) lack of planning in distribution methods, (3) limited publicity, and (4) low level of knowledge and awareness on the part of heads of institutions and librarians.

Mohinder Singh classifies Government of India Documents under the following heads:

1. Administration Reports
2. Statistical Reports
3. Commissions and Committees Reports
4. Research Reports
5. Bills, Acts, Laws, Codes, Etc.
6. Law Reports, Digests, etc.
7. Records of Proceedings
8. Rules and Regulations
9. Periodicals
10. Maps and Charts
11. Lists and Bibliographies
12. Popular Descriptions
13. Publicity Literature

The same classification holds good for the State Government publications. A significant aspect of the government publications is that the bulk of them are not priced, they are meant for legislators and administrators. It is extremely difficult to identify such unpriced publications.

Some of the important sources for identifying and locating government publications in India are the following:

1. **Government Publications of India: A Survey of Their Nature, Bibliographical Control and Distribution System**
—By Mohinder Singh, 1967

2. Government of India Publications

—By Mohinder Singh, 1982.

Part I of this volume attempts to discuss the nature and scope of government publications, introduce numerous sponsoring agencies of the Government of India, and explains their publication and distribution mechanism, bibliographic control, and sources of access. Part II contains a 'Select Bibliography' of monographs and serials which provides a fair view of the spectrum of government publications. Efforts have been made to include information about important publications directly published by various sponsoring agencies.

3. Catalogue of Government of India Civil Publications (Subject-wise arranged, corrected upto, 1969)

4. Catalogue of Government of India Publications including periodicals, 1980

5. Parliament Library Bulletin

A comprehensive and regular accession list which contains an independent section on government publications.

6. The Library of Congress Accessions List: India

The Library of Congress Office, India, New Delhi acting as an acquisition agency for the Library of Congress and some universities and research institutes in USA published 19 volumes of this monthly till 1980. Government of India publications are entered in the accession list. This has been superseded by the *Library of Congress Accession List, South Asia*, from 1981.

7. The Library of Congress Accession List: Quinquennial Serials Cumulation, 1976

Volume II of this indicates government and quasi government serials.

Observation

D. Ravindra Prasad

K. Madhusudhan Reddy

In Social Science Research one of the most important and extensively used methods is observation. It is one of the primary research instruments. As Webbs put it "deliberate and sustained personal observation is an indispensable part of the study of any social institution. Even if the social institution itself is invisible and intangible in its wholeness, "the units, items, parts or particular manifestations of the institution are often open to close observation". This method, in fact, has been in vogue even before the emergence of organised research in social sciences.

Observational method is adopted both by laymen and social scientists. As a matter of fact, as Sjoberg and Nett have noted, "much of the material social scientists rely upon for their generalizations has been collected, analysed, and written by persons who do not define themselves as scientists nor are they labelled so by others". Observations made and recorded about their own experiences or of others by such laymen as journalists, politicians; military leaders, business executives, officials, etc., provides invaluable, indeed indispensable, source material to the social scientist. The norm 'freedom of the press' gives a special status to the journalists which permits them to observe more deeply even sensitive phenomena which is closed to the social scientists. An insight into certain sensitive political events, bureaucratic decision-making can only be had by those involved in the process. As such their memoirs and other books published by them are often invaluable to the social scientist. Kuldip Nayar's *The Judgment*, Kaul's *The Untold Story*, are a few invaluable books which are based either on their own experiences or observations.

Such literature by laymen has many limitations and, therefore, has to be used with caution. Sjoberg and Nett have identified four such limitations. In the first place, the writer does not always make it explicit whether the study is the result of direct observation by him or of others. Secondly, memoirs are written many years after the occurrence of the event. As such the reliability of data is doubtful as the author mostly depends on his memory. Interpretation of events after a lapse of 5, 10, or 20 years is, therefore, hazardous. Thirdly,

the laymen do, not observe the human behaviour in terms of an explicit theory or set of hypotheses. Fourthly, the social scientist is often unable to assess accurately the writer's motives and thus the objectivity of the data.

As researchers, we want to use more scientific methods and quantitative techniques in all research. But as social sciences deal with society in its totality—social, political, economic, cultural, etc., factors—it is not always possible to use only quantitative techniques. As Dean and others have rightly observed that, "sometimes quantitative data are difficult, almost impossible, to obtain, sometimes the relationships we want to examine are not explicit; often the problem is in the explanatory stages of research; or perhaps we want to obtain elaborate quantitative data on an individual case history". In all such cases structured, quantitative, scientific methods may not be of much avail in research and observation may be the best method or at least best alternative. Generally observational technique is adopted for testing hypotheses where structured methods can not be employed; reconstruction of an event or series of events; and pilot inquiries into new problem areas where the purpose is production of hypotheses rather than their verification.

This method has been defined by different people in different ways. It is an accurate watching and noting of the phenomena as they occur in nature with regard to the cause and effect of mutual relations. Young has defined it as deliberate study through the eye; which may be used as one of the methods for scrutinising collective behaviour and complex of institutions as well as separate units composing of totality. Observation may be divided into different kinds viz., uncontrolled observation and controlled observation. Goode and Hatt call these two as simple and systematic observations. We shall examine these different types in detail.

Uncontrolled Observation

Pauline V. Young calls this type of observation unaided type of observation. In this, observation is made in the natural environment without being influenced by outside controls or external forces. The observer does not plan his study in advance. As Young has observed the researcher resorts to careful scrutiny of real life situations making no attempt to use precision instruments. This results in the study of situations in natural surroundings. Most life situations must be studied in the socio-cultural setting as they occur, rather than in artificial surroundings created through controls.

Most of the knowledge about the social phenomena generally is derived through this type of uncontrolled observation only. This enables first hand acquisition of knowledge and collection of data. In this the techniques are not standardised nor variables controlled.

One serious limitation in this type of observation is that observer may try to generalise from a single situation. As Bernard has

rightly pointed out that the data are so real and vivid and therefore our feelings about them are so strong that we tend to mistake our emotions for the extensiveness of knowledge. In the uncontrolled observation the observer has to collect the data sometimes which is not relevant for the research purpose. Thus this type of investigation consumes more resources, both human and otherwise. Another danger is that because of the wider coverage, due to absence of controls data collected may not be directly related to the phenomena under observation. Observation involves 'staying' in the study environment by the researcher to collect data and information. As he stays with the study group the researcher interacts with the members of the group in different ways or assumes different roles in relation to the members of the group. Nature of observation depends upon the type of role assumed by the researcher. Buford Junker suggests four different observational roles to the researcher, viz., 1. complete participant, 2. participant as observer; 3. observer as participant; and 4. complete observer. In what follows we shall examine these different types of observation.

Complete Participant Observation

When the investigator or researcher actively participates in the activities of the group under investigation that is known as participant observation. In this researcher is free to participate as a member of the group and as such he is not subjected to any controls or restrictions. He lives and shares in lives of the group which he is studying. The researcher associates himself with the group under investigation not as a researcher but as a full-fledged member of the group. Thus investigator withholds his true identity and he is disguised so as to have a critical understanding and analysis of the phenomena under investigation.

The participant observer need not always undertake the same jobs or activities as other members of the group which he is observing. He may find a job which is acceptable to the group and which enables him to actively participate in the group. At the same time he should ensure that his membership in the group should not 'disturb the usual patterns of behaviour'. If the situation demands and if it helps the observational process, the membership of the group may be part-time; or if it is possible may be a complete or full-time membership.

The participant observer during the course of his observation has to keep in mind various factors viz., the interactions and inter-relationships between the members of the group, the role of values and norms that influence group behaviour, the regularity of behaviour, etc. In his role as an observer he should observe certain principles and take certain precautions so as to get needed co-operation and maintain rapport and relationship with the members of the group. As Zahoda and others have observed, the observer should keep in mind (1) explanation should be brief and simple; (2) it should be general in form as to cover all sorts of works which

participant might undertake; (3) seek the support of the key people; and (4) be on the lookout of the people in the community who are themselves keen observers and in strategic position to observe. The observer must also be very responsible and cautious in his behaviour so as to be objective and gain the confidence of the participant group. Another feature is that the observer should desist from acquiring any special status in the group. If he acquires some special status, his behavioural pattern may change from an observer to that of an active member and in his latter capacity he may not be in a position to do justice to the investigation. Instead of being an observer of group behaviour, cultural traditions, interactions, procedures and processes, he may acquire bias and lose his identity as an observer.

The researcher, if joins the group in disguise, and the members are unaware of the presence of an outsider the researcher will have access to almost all the information which otherwise is not possible to collect. He can observe the actual behaviour of the group which can not be gained either through the questionnaires or interview schedules.

The participant observation has many advantages as well as limitations. The observer can gain insight into the socio-economic or political phenomena in a natural setting. As he becomes a member of the group, the group can be studied without they being conscious of it. Once the group becomes conscious of the presence of the researcher, they also become conscious of their weaknesses and try to cover up the real feelings and attitudes, and as such naturalness gets lost. Secondly, he can gather more information as a member of the group than from outside. As a member he can observe keenly the details of the phenomena, which is otherwise not possible. Thirdly, participation in the group enables the researcher to gain greater insights and appreciation of the phenomena. He will also gather the real and correct information than is otherwise possible to a non-participant. Fourthly, certain phenomena and behaviour are not open to observation from outside or from a distance. In all such cases the participant observation is the only method of investigation to gather information. Similarly a non-participant observer may miss many significant and symbolic factors which are open to a participant observer. Finally, the correctness of the observed phenomena is never in doubt as it is not gathered through the secondary sources but gathered through direct observation, participation.

It is not always possible, however, to gain the real insights into the phenomena through participant observation. For, it has many limitations too. Firstly, the observer may identify himself with individuals or groups and may develop emotional attachment to certain groups or values thereby losing the detachment, impartiality and objectivity of a researcher. Such emotional identification conflicts with the ideals of objectivity and the real phenomena can not be properly analysed. The observer also narrows his range of

experience to a particular group or 'clique' and becomes oblivious of what is happening outside the group. Secondly, certain phenomena cannot be observed in a short time available to the research scholar. Similarly certain cases or phenomena can not be investigated through participation. Thirdly, the researcher can not cover wider area through participation and as such the veracity of the conclusions reached from the observation of the small group or place may become doubtful. Another problem is, because of effective participation the researcher may acquire a status, or the group may confer a status on the researcher. In either case the personality factor may acquire supremacy in investigation and therefore the study loses its objectivity and scientific temper.

The presence of an outsider either with or without the knowledge of the group, it is said, distorts the situation and changes the behaviour of the group. Another handicap of this method is that experience of the researcher in social sciences, in almost all cases, is unique and as such repetition of the method becomes impossible. Because of the uniqueness of situations techniques cannot be clearly formulated or standardised. Finally, observation of phenomena, both in temporal and spatial dimensions demands more resources of time and money which is serious limiting factor in social research.

Participant as Observer

In this type of observation the researcher reveals his identity and the group is aware of this. This minimises the problem of role pretension to the researcher. However it behoves him to retain sufficient elements of the stranger to avoid actually reaching intimate form. Thus in fact the demands of role pretense are great. Except this awareness of the role of the researcher, this type of observation is similar to that of the participant observation which we have discussed above.

Observer as Participant

In this type of participant observation, the researcher participates only to the extent required. This obviates the problem of 'going native' or complete detachment. This type of observation may run the risk of 'superficial observation' or may lead to misunderstanding both on the part of researcher or study group.

Non-Participant Observation of Complete Observer

In non-participant observation the researcher either observes the phenomena from a distance or while being present in the group never participates in its activities. The major differences between participant and non-participant observational techniques is that in the former the observer becomes a member of the group and as such behaves as a member of the group and actively partakes in all its activities. In the latter though the observer associates himself with

the group physically, he keeps aloof from its activities and observes the phenomenon as it occurs passively. But as the presence of an observer in the group makes it difficult and sometimes impossible, it is generally not possible for the observer to be passive and therefore tries to associate himself with the group and thus associates himself with it. Therefore, Goode and Hatt call it 'quasi-participant' observation than non-participant observation.

In this method of observation, it is argued that because of the detachment of the observer with the activities of the group, objectivity and impartiality can be maintained. The observation is devoid of personal prejudices of the observer. As he does not identify himself with any individual or group, he can maintain cordial relations with the members of the group and will have access to the entire information. Another advantage is that the researcher can maintain his own status as a researcher which may be difficult to maintain once he starts participating in the group. Thus the non-participant observation, as Goode and Hatt have put it, has three distinct advantages, viz., the observer being a stranger is less involved emotionally; as a researcher he is eager to learn; and with his occasional interaction or participation, he does not remain a mere alien.

The observer can study and analyse however only that phenomena which occur in the formal organisations which he is observing. But in most cases, because of the presence of the informal organisation, much transpires outside the formal group. In many such cases the formal group only ratifies the conclusions reached in the informal organisations. Non-participant observer may not have access to the informal organisations and as such he can not understand the whole dynamics of the phenomena. The presence of a third person in the group may be embarrassing and uncomfortable to the members of the group. In such cases their behaviours may also get altered during the presence of the observer. Quite often the non-participant observer because of the detachment may even be looked with suspicion which is again a serious limitation in the non-participant observation. Thus, the non-participant observer may not really gain real insights into the phenomena.

Controlled Observation

Uncontrolled observation is useful in exploratory studies. For a more systematic collection of data and for verification of hypothesis this method poses many problems, as we have seen earlier. Therefore, controls are imposed on the observer or on the object. As it is difficult to impose controls on the object in social sciences, generally controls are imposed on the observer. Such controls increase precision, reduce bias, ensure reliability, systematise procedures and increase objectivity. In this method, observation is carried according to a plan. This enables repetition of the phenomena and consequent observation with precision and objectivity. Sometimes controls are imposed both on the phenomena and

observer himself. The former are laboratory type of experiments which Mayo called 'clinical method'. The following are a few control devices generally used in controlled observation:

1. Preparation of a detailed observational plan.
2. Use of observational schedules.
3. Use of mechanical appliances like photos, tape-recorders, etc.
4. Sociometric scales.
5. Hypotheses.

The formal interview, observation through sampling, use of questionnaires are also used as control devices. Under controlled observation, controlled group may be ignorant or aware of observation. In case of the latter, that must be made clear and the objectives of the study explained clearly. This enables the group to clear their doubts, if any, and to help the researcher in his work. In all such cases after an initial period of uneasiness and non-cooperation in some cases, the group will allow the observer to become a member of that group as any other. In all such cases the rapport established by the researcher plays a significant role.

In this method the researcher makes it explicit as to the conditions under which observation was made. This enables others to know the limitations of the study.

Process of Observation

Five sequential steps were identified by Nan Lin in the observational method, viz., preparation and training, entry into the study environment, initial interaction, observation and recording and termination of the fieldwork.

The first step in the observational process is to decide as to what, when, where and how to observe. This enables the researchers to have a clear understanding about the research problem, research site, research methodology and the training for the initiation of the research project. The observer should decide as to the type of observation—participant, controlled, non-controlled observation, etc.—that should be adopted. This apart they should also be clear as to the other methods that are likely to be adopted in the research process and their timing. Before initiating research, the research group must acquaint themselves about the nature and characteristics of the group that is proposed to be studied. This enables them to pursue research with considerable ease.

The second step is entering the study environment. The entry into the study group is not always an easy task. If the study is related to a governmental establishment the permission of the appropriate authority may be necessary; if the study is related to a

local group like the village Panchayat, the approval of the key persons may be most crucial. Always a letter from the appropriate authority by itself may not evoke ready response from the group to be observed. In such a case the approval of the important members of the group may be most helpful than a letter from the higher authorities. Therefore, a letter from the proper channels should be supplemented with the approval of the key persons to gain entry into the study group. Such entry through the proper channel will enable the observer to gain ready acceptance into the group. After gaining entry into the group the observer should identify his role either as a participant observer or non-participant observer, etc. He should also develop normal relationship with the group. This is what is called the establishment of rapport. Only on the establishment of proper rapport the observer will become acceptable to the group and gain their confidence. At the same time he should impress upon the group, particularly his informants, about the confidentiality of their identification in the study. Only then the members of the group become less formal, less restrained, relaxed and will be ready to actively participate and help the observer in his research effort.

After the establishment of proper rapport and climate for study, the researcher should proceed for full observation and recording. Observation normally does not pose a problem once rapport has been established. But recording the observation poses a problem. Nan Lin summarises the process of observation very aptly in the following words: "while he should record information as soon as an event takes place, it may be disruptive to do the recording in front of the participants. Also, while recording is being done, significant events may occur and thus escape the attention of the observer. The general rule is to train the observer so that he can memorise details of activities for a period of time and they record the activities as a sequence when there is a break in the action. Depending on the pace of events and the routine of activities, a segment may be short as a minute, as long as a day. The observer should determine whether recording should be done right in front of the participants or away from them. While pocket-sized tape-recorders are easy to handle, oral statements, even in a whispered tone, may still draw too much attention and prove to be too much disturbing. Taking notes, while eliminating noise, may also draw attention. If recording proves to be too disruptive or distracting to the participants, the observer should do the recording away from them. This should not present too much of a problem, as reasonable excuses can be made to leave the group or the informants. Even if recording is done while away from the participants, the observer may still have to write down key words to keep the details from slipping from his memory. Such activity should be done as unobtrusively as possible". The recording of information should not, however, be done blindly. The researcher must verify the veracity and credibility of the statements made by different informants and

respondents. The observer must also verify the internal consistency—the statements an informant makes must be consistent with the other statements he makes; empirical consistency—the information must be consistent with what the observer observes himself; and external consistency—the information given by one respondent must be consistent with the statements made by other respondents or informants.

The last step in the process of observation is the termination of the field work. This involves not only the termination of research work on hand but also the termination of emotional relationships, if any, developed during the study. If such relationships are allowed to continue even after the field work, they are likely to affect the analysis and interpretation of data. Analysis and interpretation are likely to become biased and distorted and objectivity lost.

Observational method has many advantages. In the first place the researcher is not bound by any rigid position both in terms of the problem as also in terms of collection of data. He can reformulate the problem or make necessary changes in the problem based on the initial data collected or modify the categories more suitable for analysis. Even in the collection of data the researcher enjoys a good lot of flexibility. Because of the intimate relations **he establishes with the observed group he understands the mind of the group, their sentiments, and biases and thereby avoids unnecessary, misleading or meaningless questions.**

The researcher, who was himself an active observer either participant or non-participant, will be in a better position to classify the data, particularly the attitudes, and perceptions, etc. This is made possible as the researcher has more data about the group than a survey questionnaire could collect. In other methods like survey the research director who is not an observer himself is remote from the group and therefore frequently faces many problems in gathering data. Because of the remoteness of the researcher from the field he faces many difficulties in understanding the data collected by research assistants who may only be semi-skilled observers. But in observational method the researcher himself becomes the observer, thereby utilising highest talent.

In observational method, the researcher "can ease himself into the field at an appropriate pace and thereby avoid rebuff by blundering into delicate situations".

Gathering more satisfactory and indepth material is possible through observation. The observer starts collecting the data only after establishing right rapport with the group. If this becomes a problem, he can postpone data gathering to a later date.

Another advantage in observation is that the researcher absorbs lot of information which may be extremely valuable at a later date as the research gets along or the focus of research gets changed. In

this process 'difficult-to-quantify' information can be collected and presented in a less distorted form than in other methods.

In covert research and in research programme where resources are a constraint, observational method has a distinct advantage over other methods of research.

Problems and Limitations

We have discussed earlier that observation, in many cases, is unstructured and therefore the collection of data is non-standardised. As a result the data collected through this method is not useful for quantification and statistical interpretation. The researcher's interpretation is, therefore, mostly impressionistic rather than based on scientific data. This is a major limitation in the observational method.

Likelihood of bias is another important limitation in observation method. The researcher, as a member of society, acquires beliefs, values and forms his own ideas about the system of which he is a part. These values and beliefs, quite often, however conscious the social scientist may be, and however closely he recognises them, affect the observational process as also analysis theory building later. To overcome the impact of hidden biases on observation Sjöberg and Nett suggest self-criticism as well as continuous dialogue among scholars as a necessary, if not a sufficient, condition for sustaining objectivity. They observe that "it is through this dialectic that scientists gain a conscious awareness of their theory which in turn makes it possible to hold constant or to 'suspend' one's personal ideas and values". Because of the flexibility in the collection of data, the data collection may be in tune with the whims and fancies of the researcher, sometimes without his knowledge. Quite often as a result of close rapport the researcher establishes with the group, the former may develop strong relationship or intimacy with a few and draw undue information from that group. If that group is biased towards one point of view, the researcher always gathers mass of biased data. In the process he may be blind to the other data. The researcher himself may be unaware as to how representative data he is getting because of the relations he established and situations in which he is participating. Thus the very flexibility which the observational method promotes is also a clear invitation to bias. This must be guarded so that the study may not get vitiated by such data. A third limitation is that observational method is useful only in the case of relatively small group or system. One cannot adopt this method in case of large groups covering a large area and if the event itself is very extensive. Similarly a society's value system also poses problem for observational method.

Certain spheres of social and political action are considered private and as such are not open to observation. For example, voting in the elections. In such cases researchers must necessarily employ other methods of data collection. The observational method

is useful to study the situations as it exists in the present or the ongoing situation. But to gain a perspective on the present one he has to learn the people's traditions and history. But such historical events are not open to direct observation. Here too the researcher must adopt other methods to gain an insight into the phenomena. Certain events and situations, particularly the unpredictables like hijacking, riots, etc., do not lend themselves for any scientific observation. The researcher has to depend on secondary observations and where even such methods are difficult due to passage of time, depend on other methods.

What the scientist, particularly the social scientist, observes is a function of several variables, viz., scientist's personal beliefs and values apart, his conceptual base, his status and role structure his observation of social phenomena. Generally scientist's observations are affected by hypotheses, or theoretical assumptions. There is the danger of the hypotheses or the theoretical assumptions becoming so fixed that they deflect the observer from contradictory evidence. Similarly the role, status, sponsorship of researcher also condition the way data is collected. For example, the research undertaken at the behest of the government gets different reactions than that taken by a university. This is because the public form stereotypes about their environs, including researcher and the research. In such a case the social scientist becomes captive to such stereotypes and to that extent the research gets vitiated.

Certain ethical questions are raised about the controlled-observation. To what extent the use of electronic devices is justified in direct observation? To what extent the researcher can intervene in the lives of those under observation? To what extent the researcher can gain access to information under false pretense? These questions, apart from raising certain ethical questions, also undermine public's confidence in research.

To overcome some of the limitations discussed above and to increase the accuracy of the observational method Nan Lin suggests certain guidelines which help the researcher to successfully collect, analyse and interpret the data. Firstly, use of audio-visual equipment like tape-recorders, cameras, etc. Use of such equipment reduces the heavy dependency on the memory of the observer. Secondly, observation should be undertaken, wherever possible, by a number of observers drawn from heterogeneous backgrounds. This enables the researcher to cross-check the data recorded by different observers with different backgrounds to increase its reliability. Thirdly, 'the observer should clearly delineate between fact and interpretation in recording'. This helps the researcher greatly in the analysis and interpretation of the data. Fourthly, "to obtain and record accurate information, the observer should be constantly aware of the relationship (1) between himself and the informants, (2) between himself and the rest of the group, and (3) between the informants and the rest of the group. These relationships must be taken into account in the recording and interpretation of

information". This is important to overcome the possibility of the observer 'going native'.

Whatever be the merits and demerits of observation, it is an important and indispensable method of data collection in social science research. But much depends upon the observer himself. Therefore training the researcher in scientific observation will obviate the obvious pitfalls in this method to some extent.

Interview

V. Sivalinga Prasad

In social life the interview is universally used for the study of human behaviour. The lawyer, the physician, the journalist, the social worker, the personnel officer—all depend partly on interviews to meet their professional demands. The social scientist also extensively uses this method in his research. Social scientists use various tools for the collection of data. The interview method is one of the traditional tools of data collection. Much of the data in social sciences is generated by interview. The social scientists have always 'communicated' with people and derived insights from such communications.

Though the interview is one of the widely used methods of social data collection, it does not imply that it is the best method of data collection for all the times. However important and universally used, every method has its own area of advance. For example, the observation method is considered as appropriate tool for the understanding of the behaviour of people. But this method may not be useful for the measurement of the attitudes and perceptions and is obviously unable to prove the past or to determine the individual's intentions for the future. If the focal data for the research project are the attitudes and perceptions of the individuals, expectations, anticipated behaviour and the experiences of the people, the interview method is considered as one of the best methods. In social research it can be used for describing the phenomena, testing of hypothesis and building of new hypothesis. This method is widely used in the studies on political behaviour, administrators' perceptions, market operations etc.

Meaning

In simple terms interview means "conversation with a purpose". In the words of Brown and Ghiselli, "The term interview stands for a generic concept which includes a variety of procedure used in collecting data through a person to person contact between an interviewer and a respondent". P.V. Young defines it, "As the very term implies, interviewing is an interactional process, it is a mutual view of each other". Goode and Hatt also feel the same way when they say that "interviewing is fundamentally a process of

social interaction". It is a method of data collection mainly through the verbal interaction between the respondent(s) and the interviewer.

Types of Interview

Broadly, on the basis of the form adopted, the interviews are categorised into two types i.e., the interview and the unstructured interview. The interview based on the pre-determined questions and the standardised techniques is called the structured interview. Here the number and nature of questions, order of asking them, wording of questions, recording system and everything in the interview process is standardised. The response patterns also are standardised in the form of know/don't know or yes/no etc. The questions will be mostly close ended where the alternative responses are given for the choice of the respondents. Because of the insistence on a specific form this method is also called as a formal type of interview.

The structured interview has the greatest advantage of uniformity and precision. It provides safe basis for the generalisations. To a great extent, the interviewer's bias can be restricted. It is more methodical and easy to administer. But this method suffers from some serious limitations. The interview, a process of social interaction, has a personal touch, which requires greater flexibility in administering. The rigidity of the process makes it mechanical, sometimes, defeating the purpose itself. In this method there is a danger of form getting importance than the substance. The unstructured interview method is considered a way to overcome some of these deficiencies.

The unstructured interview method in contrast to structured method, allows greater flexibility in the form of interview. The flexibility is allowed in the number of questions, method of questioning, sequence of questions, etc. In the whole process of the interview, the interviewer is given more freedom to choose the form depending on the specific situation. The interview is adjusted to the level and conditions of the respondent. The wording and the sequence of questions are changed keeping in view the response pattern. This type of interview lays emphasis on the purpose rather than the form. The discussions with respondents are more informal in nature mainly aimed at collecting the maximum information. Because of the informal form this method is also called as the informal type of interview.

In Indian situation the informal interview has many advantages. The formal discussion creates an artificial atmosphere resulting in psychological barriers of communication. On the other hand the informal chat creates more congenial atmosphere for effective communication. In a highly diverse situation of India, the standardised pattern imposes severe limitations on interviewer. The unstructured interview method suits well to our social situation. In

spite of these advantages, we must also be aware of the limitations of the unstructured interview. Flexibility makes the uniformity, the necessity for valid generalisations, a casualty. The diversity in interviews, a result of informality, makes the analysis of data very difficult. The administering of unstructured interview also requires higher skills. Only the well trained and the highly skilled persons can conduct these interviews. The problem of personal bias of interviewer also is more in unstructured than in structured interview.

Both the structured and the unstructured interviews are used in the collection of the data. Generally in a team research the structured interview method is used to achieve uniformity and standardisation. In individual research the unstructured interview method is more extensively used. In many cases the data of the structured interview is supplemented with the data collected through the informal interviews. The structured and unstructured interviews are not the exclusive categories. A judicious mix has to be made by the social scientist.

The classification of interviews is also made on the basis of the number of persons participating in the process. On this basis the interviews are categorised as group interviews or individual interviews. Another criteria for classification is based on the functions. Accordingly they may be classified as diagnostic interviews or therapeutic interviews.

Process of Interview

There are three important phases in the interview, i.e., rapport building, probing and recording of responses. A brief discussion of these three aspects is necessary to understand the problems of the interview process.

The success of the interview mainly depends on the capacity of the interviewer to build rapport with the respondent. Rapport refers to the atmosphere or climate of the entire relationship between respondent and the interviewer. The rapport building refers to the capacity of the interviewer to motivate the respondent to communicate. Why should the respondent agree to be interviewed is a difficult question to answer. If this question is answered to the satisfaction of the respondent, half of the problems of rapport building are solved. Though the research has the social relevance (a disputable claim in many cases) the respondent mostly looks at it from its immediate relevance to him. In case of most of the university research it is difficult to communicate its relevance to the uneducated rural masses. Even the enlightened respondents also are sceptical of the research. In this regard the writer had very interesting experiences in this field study. When he approached a Sarpanch (President of the village Panchayat in Andhra Pradesh) who is holding that position since 15 years, for interview, he commented; "since 15 years, people are coming and interviewing me.

They are getting degrees and promotions. But there was no change in the working of the Panchayati Raj institutions". In this situation it is very difficult to convince him the social relevance of research on Panchayati Raj institutions. Another respondent bluntly asked the present writer, 'What is that I get if I discuss for 2 hours with you'. Very difficult to answer. Fortunately these are not the typical responses, and we had many happy experiences of good rapport building with respondents. The field experiences are diverse. The researcher must be prepared for all types of situations.

Generally the respondent's first reaction to a request for an interview is likely to be a mixture of curiosity and adherence to the social norm of minimal politeness. This situation, although is not a sufficient condition for building the total rapport, provides an opportunity to move further. The progress depends on the interviewer's skill and sensibility. The interviewer must realise that by granting an interview the respondent is doing a favour. The interview must begin with pleasantries and introductory questions of general nature to generate interest in the respondent.

The initial introduction is an important phase in the rapport building. The person or the agency through whom one approaches makes a difference to the rapport building. It is suggested that the sequence of interview introduction should follow the following four steps: They are: 1. Explain the purpose and objectives of the research, 2. Describe the method by which the respondent was selected, 3. Identify the sponsor or the agency conducting the research and 4. State the anonymous or confidential nature of the interview. In specific situations all these four steps may also create problems in establishing rapport. When the researchers go to the villages for conducting interviews, sometimes poor people gather around them with the feeling that these are government people (sent by Smt. Indira Gandhi) came to dole out favours. When they come to know the real purpose, they flit away making it difficult to get the sufficient number of respondents. To the rural people explaining the respondent's selection procedure is also very difficult. If the research team insists on interviewing only the specified respondents, without giving convincing explanations, it raises suspicion in the minds of respondents blocking the channel of communication. Identification of the sponsoring agency also has certain problems. If the sponsoring agency is well known and enjoys high prestige in the society, it helps in building the rapport. But there are also certain universities and institutions which acquired notoriety as the centres of extremist activities (they may be the real centres are the images created by the vested interests). In Andhra Pradesh situation this has serious consequences for researchers. The researchers from these centres are handicapped in conducting interviews in specific areas, as the respondents were already prejudiced against these institutions.

The rapport building with the respondent requires a thorough understanding of the respondent and his social environment. The interviewer must also appreciate the problems of respondent. Sometimes in our anxiety to stick to our time schedule we insist on taking the interview unmindful of the personal inconvenience of the respondents. It makes the interview a formal affair. The rapport building is both an art and a science. We must understand that there is no one way of building the rapport. There are only certain do's and don'ts. Their application depends on the personal capabilities of the researcher. The interviewer must be a good psychologist. He must be capable of reading the correct meanings of the facial and the physical expressions in addition to the spoken word. The interviewer must be an analytical listener.

Probing is another important phase in the interview. We must realise that asking right questions is more difficult than the answering of questions. Generally an interview guide is prepared for the interview. The right type of questions should be asked in the right manner and right language. The questions must be capable of generating all the relevant information. We must probe deep into the matter to gain the insights without giving an impression of undue curiosity. The interviewer must take care of the style of putting questions and language used. He must be aware of different nuances of the language.

In interviews sometimes the respondents may go on talking on many things which the interviewer may feel not relevant to his purpose. Changing the course of discourse without hurting the respondent requires great skill.

Recording of responses is the next phase in the interview. It can be done in two ways. One, recording at the time of interview and two, recording after the interview is over. Both the ways have certain advantages and disadvantages. Recording at the time of interview ensures accuracy. In this method all the relevant information can be noted. But in Indian situation the recording generates inhibitions in communication. Most of the respondents who are otherwise willing to discuss and air their views freely on men and matters, once we start recording them become cautious and careful in their observations. Most of them who want to say many things are not willing to go on record. To ensure the discussion it is suggested to record the discussions after the interview is over. But the recording after the interview has certain limitations. In this method the recording is based on the memory, affecting the accuracy. To reduce the dependence on memory, it was suggested to record the responses immediately after the interview is over. The research diary may be maintained to keep record of the daily interviews.

Limitations of the Interview Method

The interview method mainly depends on the individual researcher for the data collection. Because of the personal bias the data

may be distorted, resulting in wrong generalisations. In spite of the best efforts the personal bias cannot be totally eliminated in this method. Because of too much reliance on individual and his memory there is scope for distortion and misinterpretation of the data. It gives scope for doubting the reliability and the validity of the research findings based on this method.

The social conditions in India are also not conducive for the effective use of this method. The social inhibitions make the job of interviewing women respondents very difficult. In a rural situation of extreme inequalities the dependent people cannot be expected to possess and express independent views. The social hierarchy and the economic dependence result in the oppressive situation. This situation is not conducive for the free and frank discussion on men and matters. Free expression is inhibited by authoritarian tendencies in the polity. This situation results in distortion of communication. As a result the people's attitudes and perception cannot be assessed properly. Hypocrisy of the people which Gunnar Myrdal characterised as a part of India's national character, also distorts the information. The survival instinct helped the people in mastering the art of concealment. As a result many studies mainly based on data of interview go wrong. The election studies and studies on our value preferences are the victims of this distortion. The democratic culture is necessary for the effective use of this tool of research.

The general level of scientific temper in the society also is very low. People are not habituated for the critical and systematic assessments of the social issues. As a result their opinions are just the random reflections with many contradictions. Their observations are not based on any critical analysis and deep thinking on the phenomena. Most of them are apathetic to social problems.

The science of interviewing also is not developed. The tools are not sufficiently sophisticated. The contemporary social science does not provide the interviewer with adequate methods for dealing with all the variables at work in the interviews.

Interviewer's Training

In certain academic circles, there is a feeling that the interviewing is the easiest of the research work and can be done by anybody. The job of interviewing is mostly entrusted to the junior research scholars without sufficient training. They mostly adopt the rule of thumb methods and collect the data on which the whole structure of the analysis and theorising in social research is built. It is an attempt to build the strong superstructure with a weak base, which has disastrous consequences.

The effectiveness of the interview method as a tool of relevant data collection depends on the skill and capabilities of the researcher. Preparing the interviewer to apply the interview tool

effectively is necessary. The scientific knowledge of the research tools must be transmitted to the researcher. The interviewer must be trained in the science and art of interviewing. Broadly the training should have three goals, i.e., (a) explaining objectives or goals of the project; (b) motivating the interviewer; and (c) imparting the specific skills. There is a need to develop certain personality traits.

The simulation technique helps in the scientific analysis of the problems of interviewing. This technique also helps in the standardization of the use of tool to achieve uniformity of application. The role plays and exercises help in gaining artificial experience in conducting interviews. These techniques facilitate the self awareness of the interviewers. It develops the quality of empathy, necessary to appreciate the problems of the other man. The role play techniques help the researcher to see the process from the other side. It helps him to appreciate how boring it will be to answer irrelevant and mechanical questions.

Conclusion

In the collection of data the social scientist must make a choice of the tool depending on the situation. In certain areas like attitudes, perceptions, beliefs, feelings, past experiences and future orientations the interview method is considered one of the important tools of research. Systematisation of this tool is necessary to make it an effective instrument of data collection. The successful interviewing heavily depends on the capacity and the skills of the interviewer. The interviewer must have the thorough grasp of the social environment of his study area. He must be properly motivated in his job, and must be sufficiently equipped with capabilities to motivate the respondent. He must be insightful and successful in recognising and dealing with the social-psychological phenomena of the interviewing process. The interviewer must be aware of the strengths and the weaknesses of the tool he is using. The awareness of its strength gives him the confidence and the capacity to use it effectively. The awareness of the limitations ensure its balanced use.

Questionnaire

P. Satyanarayana

Questionnaire is widely used for data collection in social research, particularly in surveys. It is a fairly reliable tool for gathering data from large, diverse, varied and scattered social groups. It is used in obtaining objective and qualitative data as well as in gathering information of qualitative nature. It is treated as the 'heart of the survey operation'. In specific studies of social environment, the questionnaire is the only research tool used. In most studies it is used in combination with other tools and techniques.

A questionnaire, according to Bogardus, is a list of questions sent to a number of persons for their answers and which obtains standardised results that can be tabulated and treated statistically. Goode and Hatt treat it as device for securing answers to questions by using a form which the respondent fills in himself. The *Dictionary of Statistical Terms* defines it as a "group of or sequence of questions designed to elicit information upon a subject or sequence of subjects from an information"

Questionnaire—Schedule—Interview guide

Sometimes, a distinction is made between 'questionnaire' and 'schedule' and 'interview guide'. A questionnaire is a tool or device for obtaining answers to a bunch of questions by the respondent or informant who fills in the form of questionnaire himself. Generally, the questionnaire is mailed to the informants who are to give answers in the manner specified either in the covering letter or in the main questionnaire itself. The sender or the researcher does not meet and help the informant in filling the questionnaire. On the other hand, a schedule refers to a form of questionnaire which is generally filled in by the researcher or the interviewer himself. He sits with the informant face to face and fills in the form. The researcher assists the respondent whenever necessary, in the interpretation of questions. The fundamental difference between a questionnaire and a schedule lies in the method of filling the form containing a set of questions. A questionnaire is 'self-administered' whereas a schedule is not. Otherwise, there

is not much of difference between the two devices. The methodology of constructing questions is almost the same in both the cases. An interview guide is a set of points, topics or matters which must be necessarily covered by an interviewer while conducting the interview. Interview guide is very useful because it helps interviewer in covering all the dimensions of investigation for which he conducts interview. At times, questionnaire or schedule itself is used as the interview guide.

Questionnaires and schedules are increasingly used for the collection of varied and diverse data in survey research. Their popularity and utility are enhancing day by day. The reason for growing popularity is the recognition by social researchers of the importance of quantitative measurement of qualitative social behaviour. They are also useful as supplementary devices in other methods of data collection such as observation and interview. They also assist in standardising the observations and interviews. Moreover the questionnaire is specially more useful and economical in situations where the respondents' geographical dispersal is wide. It also serves another purpose; it isolates the respondent from external influences. The respondent is totally free to express his views according to his knowledge, views and attitudes in an unbiased manner. Data obtained without external influence is more valid and reliable.

Types of Questionnaire

Questionnaire may be broadly of two types, viz., structured and unstructured questionnaire.

Structured questionnaires, in the words of Pauline V. Young, are those "which pose definite, concrete, and preordained questions, that is, they are prepared in advance and not constructed on the spot during the question period". Additional questions may be thought of and asked only when some clarification is needed or additional information is sought from the respondent. Certain types of questions are automatically structured by virtue of their nature. Answers to these questions are normally given with high precision without any vagueness and ambiguity. For instance, questions on age, marital status, number of children, nationality etc., are automatically structured.

The structured questionnaire may be further categorised into two, viz., closed form and open-end questionnaire. A closed-form questionnaire is one in which questions are set in such a manner that it leaves only a few alternative answers. The informant is left with only a few choices to answer them. It may be of two types: (1) one in which question is provided with only two alternatives of saying 'Yes' or 'No' and (2) the other in which the respondent is provided with a limited number of answers from which he has to choose one answer. The open-end questionnaire, on the other hand, is one in which the respondent has full choice of using his own

Questionnaire

style and diction of language, expression, length and perception. The respondent is not restricted in his replies to the questions and his answers may be free and spontaneous. He has thus enough freedom while providing answers to open questions. Open-end questionnaire is used mainly for intensive studies. It is also useful for preliminary exploration of new problems and situations. Though the open-end questionnaire provides ample freedom to the respondent, it creates problem of proper classification, tabulation and analysis, as some respondents give meaningless responses in an unrestricted way.

The unstructured questionnaire contains a set of questions which are not structured in advance and which may be adjusted according to the needs of question period. It gives sufficient scope for a variety of answers. The unstructured questionnaire is used mainly for conducting interviews. However, it also aims at precision and contains definite subject matter. Flexibility is its chief merit. It aims at securing from the respondent the maximum possible information. "This form of questioning assumes insight, articulateness, and possession of facts by the respondents. . ."

Besides structured and unstructured questionnaire, the pictorial questionnaire is also sometimes used for collection of data, specially when they have to be gathered from the children or illiterate persons. In a pictorial questionnaire, the selected alternative answers in the form of pictures are given and the respondent is required to tick the picture concerned. This questionnaire may be very useful for collecting data in a developing country like India, specially from the rural masses who are mostly illiterate and less knowledgeable. The serious limitation of this questionnaire is that it is lengthy in form. Also it is highly expensive.

Construction of Questionnaire

In spite of the availability of well tested and theoretically sound guidelines, questionnaire framing is not an easy task. No questionnaire can be acclaimed as perfect and faultless. Research experience and commonsense are the best guides for formulating a fairly good questionnaire. Question design is generally an art rather than science.

The first thing to be designed is the physical format of the questionnaire. Generally little attention is paid to the physical format. Good form evokes spontaneous interest from the respondent. Though no standard format has been evolved, certain items are considered to be essential for a good format. According to Paulin Y. Young, the following items are mandatory for most forms of the questionnaire:

1. The identification of the agency or organization collecting the data should appear in a prominent place on the front of the form. If the information is collected by one agency

and sponsored by another, the names of both agencies should be shown. If the forms are to be returned by mail, the address to which they are to be sent must be clearly specified.

2. The title of the study or survey should be on the front page of the form and usually it is desirable to have it appear in large print. Printing and spacing devices can both be used for obtaining effective emphasis on the major items of the form.
3. The authority for basis or the collection of the information should be stated. If the enquiry is from a federal agency, a Budget Bureau approval number and an expiration date are required.
4. The confidentiality of the data should be made clear in such a way that the respondent will be assured of protection.
5. The dates of the period covered by the report should be stated in advance, or space should be left for them to be filled in by the respondent or the interviewer.
6. If footnotes are needed, the space for recording them should be clearly identified and the amount of space should be determined by the expected number and type.
7. A place should be provided for the signature of the respondent or the interviewer, unless none is required.
8. It is usually advisable to assign a serial number to each questionnaire in order to identify it easily, and to facilitate the control of interviewing assignments.
9. When a questionnaire contains more than one page, each page should be numbered. If the interviewer is permitted to use extra forms, an item should be inserted for the purpose of identifying each form used".

Next to the form, the most important aspect of questionnaire design is to define the research problem to be tackled by the survey and hence to decide the questions to be asked. There will be a temptation to cover too much and to ask everything that might turn out to be interesting. This temptation must be fully resisted. "Lengthy, rambling questionnaires are demoralising for the interviewer as for the respondent, and the questionnaire should be no longer than is absolutely necessary for the purpose". As pointed out by Pauline V. Young "much has been said and written about the length of the questionnaire, but the length in itself need not be a guiding factor in the design. The important consideration is that the questionnaire covers the subject and that the techniques used are those which will meet the demands of the study".

The questionnaire must introduce each topic in such a way that it ties into perceptions of the respondent. It must meet the respondent's and researcher's criteria for reasonableness and logic. The researcher must begin at the point 'where the respondent is'.

The questions should be practicable. No attempt should be made to ask a person's opinion about something he does not understand, about events too long ago for him to remember accurately; about matters which are personal or emotional. In the words of Goode and Hatt "the researcher should first lay out tentatively the logical implications of his problem and then draw upon his own experience and the literature for questions which are relevant to those logical implications. This total process is one of obtaining an even larger number of questions, and of progressively uncovering omissions, biases, and ambiguities. Ultimately a preliminary set of relevant questions is arranged."

About the level of knowledge or the amount of information of the respondent, unrealistic assumptions should not be made. Questions should not, generally speaking, presume anything about the respondent. They should not assume that the respondent necessarily possesses any knowledge or an opinion on the survey subject, or that he engages in the activity which is being asked. By asking questions that cannot be understood by a respondent, the researcher unnecessarily will lose the answer to a question. He will also pay a heavy price in terms of decreased motivation to reply.

The vocabulary and syntax of the questionnaire should offer the respondent maximum opportunity for complete and accurate communication of ideas between interviewer and respondent. The language of questionnaire must approximate the language of the respondent.

In choosing the language for a good questionnaire, the nature and structure of population to be studied should be kept in mind. Technical terms and jargon should be avoided to the maximum possible extent. Words used in ordinary conversation should be preferred. Gowers mentions many words which can be substituted by simpler alternatives. The following are a few examples given by him:

Acquaint	:	Inform or Tell
Assist	:	Help
Consider	:	Think
Initiate	:	Begin; Start
Major	:	Important
Chief	:	Main; Principal
Purchase	:	Buy

Require	:	Want; Need
Reside	:	Live
State	:	Say
Sufficient	:	Enough
Terminate	:	End

In research surveys of the general population, questions should consist of simplest words which will convey the exact meaning. A simple question consisting of simple words is more readily understood than the long complex one. Sometimes there will be temptation to put complex questions when the subject matter is complicated and multidimensional. The temptation should be resisted and a series of simple questions should be asked instead of one long complex question. Ambiguous and vague words should be avoided. Vague questions get vague answers. Vague words and phrases like 'kind of', 'fairly', 'generally', 'often', 'many', 'much same', 'on the whole', should be avoided.

It is not desirable to use leading questions. Questions should be phrased in such a way that they do not contain any suggestion as to the most appropriate response. "A leading question is one which, by its content, structure or wording leads the respondent in the direction of certain answer."

Respondent should not be compelled by such questions to give socially unacceptable responses. The respondent should not be compelled to express what is socially undesirable in answering questions.

As far as possible each question should be concerned with a single idea or with a single reference. For instance the question: "Do you like the lowering of the rates of income tax and sales tax", can be either asked as a single question or be split into two questions. If the purpose is to get the respondent's attitude towards income tax and sales tax specifically, it would be better to ask questions separately on income tax and sales tax. If the aim of the questionnaires to know the respondent's general attitude towards taxes, it would be better to ask a single question.

In arranging the individual questions together to form the questionnaire, the order of questions should be well planned. Questions should be so arranged that they make the most sense to the respondents. Opening questions should stimulate interest in the respondent and be rapport builders. Otherwise the respondent may get disinterested and may not proceed further. The questionnaire should facilitate the progress of the respondent from item to item. The sequence of questions may be determined by the "Funnel Method". Funnel method is an approach of asking the most general, broad and unrestricted questions first and following it with successively narrow or restricted questions.

Some respondents like to remain unidentified and unreorganised. They feel free to answer if anonymity is maintained. It is generally found that answers to personal questions are freely given in an anonymous mail reply. Sufficient care should be taken in deciding the extent of anonymity to be maintained and the purpose to be achieved by anonymity.

A questionnaire designer has to ensure that all the necessary items are duly incorporated in the questionnaire. The researcher may take the help of standard check lists to see that all the required items are included in the questionnaire. Check list can also be prepared by the researcher himself. Check lists differ depending on the aims and objectives of the research. However, standard check lists are of great help to the researchers. Arthur Kornhauser prepared a useful check list for formulating questionnaires. The long check list prepared by Arthur Kornhauser is well abridged by Pauline V. Young. It is worthwhile to reproduce here Kornhauser's check list as abridged by Pauline V. Young:

Question Content

Is this question necessary for clear understanding? Just how will it be used?

Are several questions needed on the subject matter of this one question?

Do the respondents have the information necessary to answer the question?

Does the question need to be more concrete, more specific and closely related to respondent's experience?

Is the question content sufficiently general and free from spurious concreteness and specificity?

Is the question content biased or loaded in one direction—without accompanying questions to balance the emphasis?

Question Wording

Do the questions contain difficult or unclear phraseology tending toward misunderstanding?

Do the questions adequately express the alternatives with respect to choices of responses?

Are the questions misleading by reason of unstated assumptions or unseen implications?

Is the wording biased? Is it emotionally loaded?

Is the question wording likely to be objectionable to the respondents?

Would a more personalized or less personalized wording of the question produce better results?

Can the question be better asked in a more direct or more indirect form?

Question Sequence

Are the answers to the questions likely to be influenced by the content of the preceding questions?

Are the questions led up to in a natural way? Are they in correct psychological order?

Do some questions come too early or too late from the point of view of arousing interest and receiving sufficient attention, avoiding resistance and inhibitions?

Sixteen Commandments: Delbert C. Miller in his *Handbook of Research Design and Social Measurement* provides a guide to the questionnaire construction. The guide has the following sixteen 'commandments' to be followed in the formulation of questions:

1. "Keep the language pitched to the level of the respondent.
2. Try to pick words that have the same meaning for everyone.
3. Avoid long questions.
4. Do not *a priori* assume that your respondent possesses *factual* information, or first hand opinions.
5. Establish the frame of reference you have in mind.
6. In forming a question, either suggest all possible alternatives to the respondent or do not suggest any.
7. Protect your respondent's ego.
8. If you are after unpleasant orientations, give your respondent a chance to express his positive feeling first so that he is not put in an unfavourable light.
9. Decide whether you need a direct question, an indirect question, or an indirect followed by a direct question.
10. Decide whether the question should be open or closed.
11. Decide whether general or specific questions are needed.
12. Avoid ambiguous wording.
13. Avoid biased or leading questions.
14. Phrase questions so that they are not unnecessarily objectionable.
15. Decide whether a personal or impersonal question will obtain the better response.
16. Questions should be limited to a single idea or a single reference."

Question designing is a matter of commonsense and experience and of avoiding known shortfalls and failings. As rightly observed by Moser and Kalton, "it is not as yet, if indeed it ever can be, a matter of applying theoretical rules. Alternative versions of questions must be vigorously tested in pre-tests and the pilot survey, for in the absence of hard and fast rules, tests of practicability must play a crucial role in questionnaire construction."

Pre-Tests

Before the questionnaire is finalised, it is always desirable to subject it to pre-testing or to conduct a pilot survey. Pre-tests and the pilot studies are the essence of a good questionnaire. As rightly pointed out by Moser and Kalton, "however experienced the questionnaire designer, any attempt to short-cut these preparatory stages will seriously jeopardise the quality of the questionnaire". The pre-testing enables the researcher to identify the mistakes and unwarranted and undesirable trends that might have crept into the questionnaire. It helps in enriching the design of the questionnaire and assists in testing the validity and reliability of statistical technique to be adopted for data processing and analysis. Goode and Hatt indicated certain signs or symptoms which may be seen during pre-testing and which may lead to correction or change in the content, sequence and language of the questionnaire. The symptoms indicated by Goode and Hatt are: (1) lack of proper order in the responses, (2) all or none responses, (3) large number of "do not know" or "do not understand" answers, (4) many qualified answers or irrelevant opinions, (5) high proportion of refusals to answer, and (6) high degree of variance in answers when the question order is changed. In situations where these symptoms are observed by pilot surveys or pre-testing, questionnaire should be changed to overcome the shortfalls and failings. "If well done and thoroughly exploited, the pilot study will usually prove to be a substantial saver of time and effort by helping to avoid erroneous and insignificant hypotheses."

After finalising the questionnaire by correcting it on the basis of pre-testing, it is mailed to the respondents, selected in a scientific way. Normally, a covering letter is sent with the questionnaire which explains why and by whom the survey is undertaken, how the addressee has come to be selected for questioning and why he should take the trouble to answer questions. This last point is significant because many a time researchers expect the respondents to answer their questions without being informed what is hoped to benefit from the survey.

Follow-Ups

The main problem with the mail questionnaire is that of obtaining a good response rate. The good response rates in respect of mail questionnaire have been lower when compared to interviews.

Normally, the response rate is low among the less educated, the lower occupational group and the uninterested in the subject of survey. The most important method of raising the response rate is the use of follow-ups. Follow-ups enhance the response rate to a considerable extent. It is desirable to reduce the non-response rate to such a low level that it cannot cause a serious bias and distort the survey.

Reliability and Validity

Grave doubts have been expressed about the reliability of information collected through questionnaires. Questionnaires have been condemned and criticised mainly for their lack of reliability and validity. The reliability of the data gathered by a questionnaire can be tested mainly in two ways: 1. The same questionnaire may be mailed to the same respondents after sometime. If the two replies are same the questionnaire can be presumed to be reliable. 2. The same questionnaire can be tried on two different samples. If the percentage and nature of responses are similar and the statistical analyses are same, the samples can be regarded as reliable.

The above two ways are not perfect and scientific. People change their views over time. Consistency in responses gets varied over time. Human beings, being what they are, consciously or unconsciously are subject to changes in social environment around them. Changes in social climate and personal lives get reflected in the expressions of respondents. In spite of the possible change in life and society the above two ways can fairly test the reliability of responses.

Advantages of Questionnaire

1. The questionnaire is cheaper than other methods. The researcher is not required to spend more than the cost of printing of questionnaires, postage and follow-ups. The investment per case is low. When the population to be covered is widely and thinly spread, and the resources are limited, the mail questionnaire is feasible and most useful.
2. Surveys can be conducted quickly through questionnaires. It does not take much time to mail the questionnaires to the respondents from whom replies would be received back within a short time after mailing.
3. The questionnaire avoids the problems associated with the use of interviewers. As a questionnaire contains clear-cut instructions and directions, there will be no need for the presence of persons to interview and record answers. The respondent himself fills the questionnaire as per the instructions contained in it.
4. The questionnaire by its very nature is an impersonal document. Standardised vocabulary and syntax of questions, standardised sequence of questions will secure uniformity of responses.

5. The questionnaire ensures anonymity. As the respondents are not required to indicate their names on the questionnaires, they feel free to express their views and opinions. Anonymity is a meaningful characteristic of questionnaire method. In view of its anonymity the questionnaire is more effective than an interview.

6. The questionnaire puts less emotional burden and causes less fatigue to the respondent. It provides ample freedom and time to the respondent. The respondent is likely to provide correct answers after careful reflection.

7. Some people may prefer to answer personal and embarrassing questions more willingly and accurately when they do not face an interviewer who is a total stranger. Thus the answers to questionnaire give a more truthful and real picture.

8. The questionnaire avoids the problem of non-contacts.

Disadvantages or Limitations of Questionnaire

1. If a high response rate is required, the questionnaire will not be greatly successful. The questionnaire is adequate in case where the rate of response can be less.

2. When the information to be obtained concerns private information such as income, sexual behaviour, communal attitude, abnormal activities, the questionnaire will not be suitable as people refrain from recording such information on the questionnaire.

3. The questionnaire cannot elicit replies from people who are illiterate and less educated. Ambiguity, vagueness, technical expressions, etc., might frighten the respondents and dampen their motivation. The questionnaire method is effective and adequate only when the questions are sufficiently simple and straightforward to be understood with the help of printed instructions and definitions.

4. The questionnaire is inappropriate where the objective of the survey involves a good deal of explaining, where the respondent is asked difficult questions or where deep probing is necessary.

5. The answers to a questionnaire can not be checked and be accepted as final. "There is no opportunity to probe beyond the given answer, to clarify an ambiguous one, to overcome unwillingness to answer a particular question or to appraise the validity for what a respondent said in the light of how he said it. In short, the mail questionnaire is essentially an inflexible method."

6. The questionnaire is not suitable in situations where spontaneous answers are wanted.

7. It is inappropriate where the views of one person only are to be collected uninfluenced by discussion and dialogue with others.

8. Where a respondent's level of knowledge is to be obtained the questionnaire may not be a right method.

9. When the respondent receives the questionnaire he may first go through the entire questionnaire before answering any one of them. Answers can not therefore be treated as independent of each other.

10. The researcher can not ensure that the questionnaire is filled in by the person who is supposed to fill. Though the researcher clearly mentions that it is a particular person's answers he needs, it is not sure that the instruction will be fully followed by the respondent. There is a possibility of a questionnaire being filled up by some other person.

11. The questionnaire does not facilitate free use of combining other methods of data collection with it. Some of the disadvantages of the questionnaire can be overcome by combining it with interviewing.

Content Analysis

B. Satyanarayana

According to Berelson 'Content Analysis is a research technique for the objective, systematic and quantitative description of the manifest content of communication'. In general, the content analysis should possess the characteristics of objectivity, system and generality. Objectivity stipulates that each step in the research process should be carried out on the basis of explicitly formulated rules and procedures. Even the simplest and most mechanical form of content analysis requires the researcher to use his judgement in making decisions about his data.

Content analysis is concerned less with the style of the text than the ideas contained in it. The distinction is rather artificial because words express ideas. But content analysis is characterized by the fact that the entities analysed are not usually words but meanings (synonyms or words with similar meanings are grouped in the same category and often include themes or whole phrases).

Generally speaking, content analysis is a method of studying 'Communications'. It was developed in the United States as a branch of social psychology known as 'Communications research'. The Science of Communications, an important branch of the social sciences, covers all communications whether public or private and includes propaganda and advertising.

The method cannot be applied to all documents. The distinction already made between documents which report facts and those which are facts, is relevant. Historical criticism is more appropriate to the former while sociological analysis is suitable to the latter. Content analysis is usually applicable to the latter and not the former.

Even the simplest and most mechanical forms of content analysis require the research investigator to use his judgement in making decisions about his data. How is category A to be distinguished from category B? What criteria are to be used to decide that a content unit (word, theme and the like) should be placed in one category and not the other. Once the document has been coded and the findings are summarized, what was the reasoning that led to one inference rather than alternative ones? Objectivity

implies that these and other decisions are guided by an explicit set of rules that minimize the possibility of analyst's subjective predispositions. Thus, one test of objectivity is: can other analysts, following identical procedures with the same data, arrive at similar conclusions? The investigator who cannot communicate to others his procedures and criteria for selecting the data, for determining the relevance of it, and for interpreting the findings will have failed to fulfil the requirements of objectivity.

Systematic approach means that the inclusion and exclusion of content or categories is done according to consistently applied rules. This requirement clearly eliminates analyses in which only materials supporting the investigator's hypotheses are admitted as evidence. It also implies that categories are defined in a manner which permits them to be used according to consistently applied rules.

The tenet of 'Generality' requires that the findings must have theoretical relevance. Purely descriptive information about content unrelated to other attributes of documents or to the characteristics of the sender or the recipient of the message, is of little value. To put it differently, a datum about communication content is meaningless until it is related to at least one other datum. The link between these is represented by some form of theory. Thus, all content analysis is concerned with comparison, the type of comparison being dictated by the investigator's theory.

The requirements of objectivity, system and generality are not unique to content analysis alone. These are necessary conditions for all scientific inquiries. In general terms, content analysis is the application of scientific methods to documentary evidence.

Content Analysis and its Application

Content analysis may be helpful when there are technical advantages because the volume of material to be examined may exceed the investigator's ability to undertake the research by himself. In studies of newspapers, magazines, movies and many other forms of communication the analyst can rarely afford to examine all the relevant data. One solution to the problem of data volume may be to analyse only a sample of it. Findings from the sample of documents selected for study can then be used to make inferences about the larger universe from which it was selected. But unless proper steps are taken to ensure that the sample is representative and unless relevant characteristics of the sample are described precisely, inferences about the entire set of documents might get vitiated.

Another approach to the problem may be to employ one or more assistants. Whatever may be the competence of the investigator, when other associates are used he must be able to translate his methods of analysis into explicit rules to ensure an acceptable degree of consistency and uniformity (i.e., reliability) in his results. For example, a hypothetical study of trends in patterns of family decision making as revealed in popular magazine fiction. Each

coder is given responsibility for stories that appear in a given decade. Their first task is to identify passages in which decisions are made in the family and then to classify them according to issue (consumer purchases, leisure activities, parent-child relations). Let us assume that the results reveal changes consistent with the investigator's hypotheses. But unless there is reasonable confidence that each analyst used the same rules for identifying and classifying relevant passages, it is impossible to determine whether the findings reflected changes in the content of the stories or differences in subjective predispositions between coders.

Content analysis is not relevant to all documentary research. It can rarely be used to determine the truth of an assertion or to evaluate the aesthetic qualities of poetry. Moreover, if the analyst uses documents to settle limited issues of fact, such as to determine whether the New York Times supported Humphrey or Nixon in 1968, methods other than content analysis could be used more efficiently. But the data the investigator seeks from the content of documents can rarely be reduced to such simple factual questions.

Basic Characteristics of Content Analysis

Generally, there characteristics are observed for the purpose of content analysis. They are as follows:

(i) *Comprehensive analysis and analysis of samples:* It is important to know whether all the available documents or a sample of them are being analysed. If an enormous mass of documents is used to establish general tendencies over a period of years, for example, if one has to find out the evolution of a journal, the radio etc., the techniques used in content analysis differ somewhat in detail from those used in opinion polls. But the general principle of 'probability method' holds good.

(ii) *The preliminary choice of categories:* The basic idea of content analysis is to place the parts of a text (words, phrases, paragraphs etc., depending on the units chosen) in a number of pre-determined categories. In a way, content analysis from one point of view is to arrange all the parts in a series of pigeon holes, and describing the text by the number of elements in each pigeon hole.

(iii) *Classifying and processing the results:* Once the categories are established, classification can begin. This is not a purely mechanical operation. Tests are necessary to confirm the validity and accuracy of all the categories. It is essential that the classification is done as objectively as possible. The claim to objectivity is one of the essential features of the method. Without objectivity, it is not possible to organize team research.

After the classification is completed, the text will have to be translated into a set of statistics which are normally analysed by the usual mathematical procedure such as percentages, averages, medians etc. Though mathematical procedures are rigorous in

themselves, the real rigour of the results depends upon the value of content analysis, in other words the value of the categories and the precision of the classification.

Content analysis has been used most frequently for research problems in which the question can be answered directly from a description of the attributes of content. In such studies the investigator is in large part free from problems of validity, except to the extent that validity is related to sampling and reliability. The content data serve as a direct answer to the research question rather than as indicators from which characteristics of the sources or audience are to be inferred.

Content analysis is being employed with a variety of materials to discover international differences in the content of communication. For example, an examination of 15 prestige newspapers published on November 2, 1956, during the dual crises in Hungary and Suez, revealed differences in coverage of these events which were ascribed to the degree of involvement in one event or the other. News of the Suez invasion had crowded the news item both in Hungary and West. In the West, the general attention was so overwhelmingly on Suez that the full significance as to what was happening in Hungary was never made clear. In the same way, a less comprehensive study compared Indian and German coverage of the concurrent crises on the Sino-Indian border and in Cuba during October 1962.

Uses of Content Analysis

It is widely believed by the social scientists and humanists that symbolic behaviour of the individual can provide important psychological data about personality, values, beliefs, intentions and other characteristics of the communicator. Personal documents, like diaries, intimate letters, autobiographies and speeches addressed to a wide audience may reveal the structure, dynamics and functioning of the author's mental life. The motives for producing personal documents may vary from psychotherapy to hopes of literary fame. Personal documents may also be produced specifically for research purposes.

Content analysis has also been used to assess psychological variables in the context of political decision-making, particularly in the area of foreign policy. One approach has emphasized elite values and ideology. In the absence of direct measures, Soviet and American publications representing political, economic, labour, military, scientific, and cultural elites were examined to identify major values. Themes regarding the economy, social and internal political affairs and external relations were coded into more than 40 category sets. An investigation of elite foreign policy attributes for the same period focussed on perceptions of the international system, power relationships and operational codes. Although Soviet and American value preferences were found to be symmetrical in

some respects and incompatible in others, the data also revealed that elites in both nations displayed a strong tendency to act and speak in such a way as to magnify differences between them. (Angell, Dunhan and Singer, 1964).

A second approach to foreign policy studies has focussed on analysis of documents written by officials holding key decision-making roles. The basic assumption is that foreign policy decisions, like all decisions, are in a part a product of the policy makers' perceptions. The choice of content analysis is based largely on the inability in most cases to use observational methods to assess the perceptions, attitudes and values of foreign policy leaders at the time of decision. When some of these direct techniques are not applicable, systematic analysis of diplomatic documents provides an indirect method to bridge gaps in time and space. Themes, which are classified into categories such as friendship, hostility, capabilities, time pressure and alternatives, will serve as the unit of analysis.

Preparing the Report

Although the research process itself is often fascinating, sooner or later it will be necessary to complete the study report. The preparation of report is the final stage of research. The main purpose of any type of research is to convey to interested persons the main results of the study, which should enable the readers to comprehend the data and to determine for themselves the validity of conclusions. Ultimately, conclusions depend upon the nature and type of content analysis.

The preparation of a scientific report is different in one fundamental respect from an argumentative essay or a literary effort. Linguistic and intellectual clarity is necessary for communicating the results to the concerned audience. Any scientific report is expected to become a part of the cumulative body of verifiable knowledge. There is an inescapable public character to research, and the investigator who is unwilling to face both the strength and the weakness of his work will soon have them brought to his attention by others. It is this which puts harsh demands upon the social scientist. He has to accept this challenge.

Case Study

F.D. Vakil

M. Ramchander

Traditionally case study has been a method of qualitative analysis. As an important tool of social investigation, it was developed particularly in U.S.A. and is extensively used in psychology, education, sociology, economics and political science. For a large majority of social researchers it is a method involving the study of a sizeable number of cases. Despite the increased use of quantitative methods and techniques, the case method continues to be an important method in social sciences research.

What is a case study?

The method of exploring and analysing the life of a social unit, be it a person, a family, an institution or a community is known as the case study method. The terms case study and case work, are often used in the context of social research. Case study as seen above refers to the intensive investigation of a particular unit, while case work relates to the developmental and adjustmental procedure that follows the diagnosis.

The case study is often termed a method, a technique, an 'approach' to social reality and a mode of organising data in terms of some chosen units. It is in fact a technique which considers all pertinent aspects of a situation employing as the unit of study an individual or group and intensively investigating it. It examines the complex situation and combination of factors involved in a given situation so as to identify the casual factors operating.

The term case study has been defined variously by different authorities. According to Stuart A. Queen, the case study is "the examination of a single situation, persons, groups, or institutions as complex wholes in order to identify types and process". E.S. Bogardus describes the case study as "the method of examining specially and in detail a given situation". According to Elmer "case study is the analysis of an abstracted phase or experience usually performed in the interest of describing some quality in the experimental whole". James A. Black and Dean J. Champion write, "case studies are usually characterised as thorough examinations of

specific social settings or particular aspects of social settings including in varying details psychological descriptions of persons in these settings". The case study approach is the intensive study of selected instances of the phenomenon in which one is interested. The focus may be on individuals, on situations, groups, on communities. According to Goode and Hatt the case study "is not a specific technique. It is a way of organizing social data so as to preserve the unitary character of the social object being studied. Expressed somewhat differently, it is an approach which views any social unit as a whole. Almost always, this means of approach includes the development of that unit, which may be a person, a family or other social group, a set of social relationships or processes or even an entire culture".

From the above definition, it can be inferred that the case study method tries to understand the complex of factors that are operative within a social unit as an integrated totality.

Meaning of Case

The term 'case' has different meanings in different disciplines and professions. For example, in medicine it means an ailing person who has approached the practitioner for necessary treatment. In education the maladjusted students, the scholarship difficulties, educational institution with peculiar problems constitute the case. In social work the term case refers to a person with an intra-psychic or inter-personal problem or a social-emotional problem but interested in resolving the problem with help of a professional social worker.

In social research the term 'case' refers to a unit of study. The unit may be a person, an episode in a person's life, a group of persons such as a family, or a class of persons such as the habitual offenders or professional demonstrators, a concrete set of relationship like the labour management relations, a specific process like rehabilitation of the displaced or community, an institution, or even an entire culture such as culture of a factory. The selected cases may be deviant cases, negative cases, typical cases, or extreme cases. Each case is a complex whole and unique. A case is non-comparable and yields non-additive and non-quantitative data. Such a case is selected for study because the usual quantitative methods fail to take into account the unique features of the case that are extremely important.

Evolution of the Case Study Method

Case study method is one of the oldest and important ones. The credit for introducing case study method into the field of social scientific investigation goes to Fredrick Leplay. According to Burgers, an English social philosopher, Herbert Spencer was among the first to use case materials in his comparative studies of different cultures. William Healy, a psychiatrist, was among the first to

adopt the case study method in his work with juvenile delinquents. The actual introduction of the case study as a method of sociological field research was made by Thomas and Znaniecki in their monumental case studies known as the 'Polish Peasant', using personal diaries, letters, autobiographies and the files of social agencies, in their search for concrete and specific details about personal conduct and group behaviour within the cultural situation. Clifford R. Shaw made his famous studies of juvenile delinquents and observed that his "initial task in the study was the accumulation of a mass of raw material in the form of cases, described in concrete and specific detail, including the use of medical, psychological and psychiatric data, as well as the cultural background of the family and the community and the life history and social relationship of the individual". He made an intensive study of series of such cases and subjected them to a careful analysis and comparison to unique and of common differences.

Such a method is referred by Kimball Young as "historical genetic method" since it provides a more or less continuous picture through time to be individual's interpretation of his own experience and often of that of others.

Representativeness of Case Studies

The main concern of social researches is the typicalness of cases and life history documents. Life and personal traits are complex and varied. Do the data provide the base for generalisation? This depends upon the integrity and objectivity of the researcher as an impartial observer. The researcher has to keep an open and alert mind to explore and to seek. He should strive for comprehensive-ness and try to throw light on process in social setting. Stounffer, Kinsey and Adorno among others have had the occasion to study a large number of cases. These social scientists found a remarkable uniformity among independently conducted studies of large group-ings in different socio-cultural and temporal contexts. The opinions of Stounffer, Kinsey, etc., in regard to the generaliz-ability afforded by case data are in tune with those of Thomas and Znaniecki. Anthropologist Franz Boas too, on the basis of his several case studies of the 'primitive groups' came to conclusion that human nature is of one piece.

But, the fact of uniformity among the cases does not warrant the conclusion that the cases under study are the typical representatives of the larger category of cases they were drawn from. It is indeed improper to overstress the element of uniformity since the similarity among cases hardly if ever extends to all the dimensions there are to life.

Assumptions and Criteria

In gathering case data it may be assumed that the identity of human nature persists, by and large, in a variety of circumstances

even though human conduct changes. This is an assumption that underlies the collection of case-data. Theoretically sociologists and social philosophers assert that if one accepts a law of nature our very acceptance implies belief in uniformity. Another assumption should be stressed, although much of a person's past may be obscure to him or out of reach to a researcher and although the reasons for a subject responses may seem mysterious, it is possible to find in most persons an underlying reaction system. All human beings experience certain physiological tensions; certain experiences are ubiquitous; e.g. birth, death, sex, drive, fatigue, etc. As Cora Dubois, the anthropologist rightly remarks, the comparative studies of personalities as determined by variations in culture are possible simply because of certain basic homogeneity or similarity evidenced in the mankind. Psychologist Allport contends that some statements about human nature broadly apply to each individual or to each member of a larger group.

Criteria for Evaluating the Adequacy of Case History

John Dollard has proposed six criteria for evaluating the adequacy of case histories. They are:

1. The subject must be viewed in a cultural series (even if he is singled out as an individual study, he must be regarded as a member of a culture group or community).
2. Behaviour of individuals must be viewed as socially relevant.
3. The family of the subject of the study must be viewed in its role of submitting to the culture and way of life of the group through its individual member.
4. Specific method of elaboration of organic materials into social behaviour must be shown.
5. Continuous related character of experience from childhood through adulthood should be stressed.
6. The social situation must be studied in order to learn kind and degree of social pressures, social forces, special participation or absention, exercised by the subject.

The permutations and combinations found in the human frame are infinite. Hence they are not specific determinants of behaviour criteria, for, life history must take full account of this basic fact.

Gordon Allport has suggested the following criteria to broaden the perspectives of case data:

1. If the life history has been written in the first person, it must be as complete and coherent as possible.
2. Life history should have been written for knowledgeable persons. That is, if the enquiry is sociological, the writer should write it on the assumption that the readers of it will be sociologists.
3. It is advisable to supplement case-data by observational, statistical and historical data since these provide standards for assessing the reliability and consistency of the material, repeat interviews with the person and personal interviews with the members of the subject's own group who are well acquainted with him.
4. Efforts should be made to ascertain the reliability of life-history data through examining the internal consistency of the material, repeat interviews with the person and personal interviews with the members of the subject's own group who are well-acquainted with him.
5. A judicious combination of techniques of data collection is a pre-requisite for securing data that are culturally meaningful and scientifically significant.
6. Life-history or case-history can be regarded as an adequate basis for generalization to the extent that these are typical representatives of a particular group.

As most of the definitions of the term case study treat a person—both as an individual and a member of a group—as a unit of study, a large number of life histories are labelled as the case studies.

Characteristics of Case Study Method

The essential characteristics of a case study include continuity, completeness of data, validity of data, confidential recording and scientific synthesis. According to Palmer any case has three important characteristics: (1) characters which are common to every individual in the species to which he belongs, (2) variations of these common attributes which are characteristics of groups within the species, and (3) other characteristics which belong uniquely to the individual and distinguish it from every other individual within the species. This method is thus the means by which we must reach the actual human experience and attitudes which constitute the full, live, and active social reality beneath the formal organisation of social institutions, or behind the statistically tabulated mass phenomena which taken in themselves are nothing but symptoms of unknown casual processes and can serve only as provisional groups for sociological hypothesis.

Functions of Case Study

Case study helps to secure a wealth of details about the unit of study which may provide clues and ideas for further research. Through the case study, as Gidding puts it, we ascertain as completely as we can the number and variety, of traits, qualities, habits or what not, combined in a particular instance. According to Mckinney the function of case study is to describe the case in terms of peculiarities that are observable. This involves the intensive examination of specific factors implicated in the case. Case study deepens our perception and gives us a clear insight into life. It is useful to support a belief, a tradition or a point of view; sometimes, to advance a new interpretation.

As seen from the above functions, a question arises whether case study helps to formulate hypothesis, testing hypothesis and generalization. The answer is partly yes. To the extent the case study provides a wealth of data and clues and ideas for further research one may be in a position to formulate hypothesis. But hypothesis testing and the consequent generalization applicable to the universe are not possible through case studies. For, case study is based on qualitative analysis. Further, although the case studies are conducted in such a way as to provide detailed information about social units they are limited in scope and not sufficient for meaningful generalization to be made to larger social aggregate.

Procedures, Techniques and Tools

The case study method is more or less a technique or an approach which views any social unit as a whole and includes the development of that unit. This method elicits data in terms of some chosen unit and seeks information in respect of processes which for the most part cannot be situated numerically. It examines style situation of person or institution as complex whole and makes use of personal documents probing many facts of the respondents' life, sharing experiences with the individuals, collecting life histories etc. The case unit may be described by an indefinite number of facts. These facts may be obtained from many diverse sources such as life histories, interviewing the individuals, from participant observation, etc. The use of set questionnaire or schedule is highly ineffective in the case study.

Life records provide comprehensive case materials. Thomas and Znaniecki have made extensive use of letters which they divided into five types: (1) ceremonial letters, (2) informing letters, (3) sentimental letters, (4) literary letters, and (5) business letters. These letters are helpful in serving an understanding of family and personal solidarity and personal experiences. In recent times, the case data are being collected by means of the ecological method.

Case data obtained through personal interviews and human documents have, within the last three or four decades, been supplemented by an increasing variety of projective techniques. The

projective techniques are designed to provide the respondent with a stimulus situation in which he will freely and directly reveal knowledge about himself and his social world.

There has come almost a tremendous improvement in the techniques of case studies during the past few decades. Elton Mayo, Alfred Kinsey, Carl Rogers and Komarovsky are some of the researchers who have used the new techniques of collecting, recording and processing case data.

The techniques of gathering and processing data are in three phases: choice of cases, recording of data and their implementation. Selection of a case for study depends on convenience. The essential elements in the choice are; first, selection of 'representative' units as far as possible. The typicalness of the cases is important for, the individual case is studied not as a definite entity in its own right but as a specimen in a culture series, whose actions are socially relevant. In this context though case study is somewhat different from statistical methods a preliminary statistical study may be useful here. According to Kimball Young many of the basic problems of case study method are not unlike those of statistics. The more careful case studies also recognise the problem of sampling, since the aim is to avoid the temptation to generalize from one case. According to Bernard "so-called commonsense inferences from cases amount to nothing less than informal statistical generalization". In collecting data, continuity, breadth and level are important. This helps in increasing precision in conceptual analysis. Second ingredient is consciousness and clarity in selecting data. Thirdly, method of recording should be easy to reference and uniform and uptodate. Two other facets of recording relate to the formation of indices and types and to the interaction in a time dimension. The successful use of the case method requires adequate and well-balanced records, of which the first ingredient is accuracy, objectivity, and the correct reproduction of information as received. Standardized observation adopts such devices as detailed notes, photographs, maps, etc. Schedules are employed for further quantification.

Limitations

The case method has its own limitations. The main drawbacks are lack of objectivity in observing and recording data, informality and subjectivity of the generalizations drawn from cases and lack of quantification check.

Kimball Young indicated that "records are open to errors of perception, memory, judgement and unconscious lies with a special tendency to over-emphasize unusual events". The main drawbacks of the case studies are: (1) no uniform and standardised system of recording case histories has been developed, (2) as a result, case histories are usually couched in highly subjective, qualitative terms and units, (3) quantitative term in some way destroys the

vitality of human touch and other essential qualities of a valuable case record. The investigator's bias is seen in all techniques, but the danger increases in case studies. There is, in short, an emotional feeling of certainty which is much stronger than in the case of other types of research. The researcher is tempted to ignore basic principle of research planning. Goode and Hatt have identified the following difficulties and problems in the case study technique: a false sense of certainty about conclusions; temptation to ignore basic principles of research design; failure to make explicit the generalisations underlying the analysis of cases; adhoc theorising; failure to test reliability; and finally case method is time consuming and requires more financial resources. In order to overcome these limitations the investigator should systematize the mass of data by condensation, reinterpretation, etc.

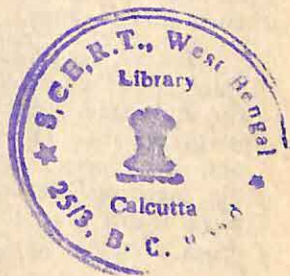
Value of the Case Study Technique

The merits of case study outweigh the demerits. Case data are the means by which we are able to arrive at the actual human experience and attitudes which constitute the full and actual social reality. It draws attention to the role of each independent factor in relation to others and provides a picture of past situations furnishing new meanings.

In recent past, attempts have been made to quantify the case data and thus render it capable of statistical analysis.

Case studies are also valuable as it develops ideas, sometimes leading to conclusion and sometimes to hypothesis needing testing by experimental or other techniques. Goode and Hatt comment "as against the analysis of individual traits alone it is highly fruitful approach, as yet insufficiently exploited by those who are currently doing research into research techniques".

Case studies are indispensable for therapeutic and administrative purposes. Through this technique of research, a researcher may develop new concepts or theories or test the existing concepts.



Projective Methods

Shalini Bhogle

The term projective methods is derived from the word projection which means projecting one's own thoughts, ideas and attributes on to others. The word projection is used to mean "the tendency to ascribe to another person feelings, thoughts or attitudes present in oneself, or to regard external reality as embodying such feelings, etc., in some way".

Projection as a defence mechanism differs somewhat from projection as used in projective techniques. According to Freud "projection is a defensive system or process in which impulses, wishes, and ideas are externalized because their conscious recognition would be too painful to the ego. But, as Murray and others have indicated projections as elicited by projective technique can actually be unrepressed, conscious, acceptable or even admirable, and need not include defensive or anxiety-avoidant components.

In an experimental study of projection boys in a college hostel rated themselves and each other on traits such as stinginess-generosity-bashfulness-forwardness etc. Subjects who failed to see themselves as others see them; or those who were relatively lacking in social insights showed a marked tendency to rate others as they rated themselves. Projective and other indirect tests are used when people may not be willing to discuss controversial issues, or to reveal intimate information about themselves, or one reluctant to express their true attitudes, if they believe that such attitudes are generally disapproved. It may be possible that they are unable to give the desired information either because they cannot easily put their feelings into specific words or they themselves are not aware about their own feelings.

Historically projective techniques arose as a protest by "dynamically" oriented clinical psychologists against what they regarded as the inability of objective methods to meet the demands of personality diagnosis. The development of these procedures is based on new principles. For example, the scoring of responses as "correct" or "incorrect" was abandoned; freedom and choice in performance were introduced into the instructions; scoring procedures became more complex, as did interpretation of the responses of subject;

and the style and manner of subject's performance began to assume importance.

Projective tests are expected to elicit responses involving not only cognitive factor but also affective factor. Most of these projective tests involve some degree of deception and some invasion on the privacy, because an individual is induced to respond under some pretext other than investigator's true interest and since they are encouraged to reveal matters that they perhaps might wish to conceal. Thus these techniques sometimes tend to be unethical.

Many of these techniques are highly ingenious and there are always questions about their validity that is how far do these methods measure what they are proposed to measure. Not all these techniques are exposed to rigorous and extensive evaluation of their validity and reliability. But in spite of these limitations the tests have a very strong plus point, and that is their great diversity of approach. In fact the best results are obtained by using a number of different measures angling on the central concept in different directions.

Projective methods originated within a clinical setting and are predominantly used as a tool for clinicians. For their purpose the tests attempt to give a comprehensive picture of their individual's personality structure, emotional needs, conflicts and other feelings. In line with their typically global approach projective techniques have been concerned not only with emotional, motivational and interpersonal characteristics but also with certain intellectual aspects of behaviour. For example general intellectual level, originality, problem solving styles etc. They are primarily tools of clinical psychologists and their use requires intensive specialized training. But, the importance of projective tests as a major tool to understand basic care of human personality has been realized extensively by social scientists all over the world and these methods are used in investigations of specific types of problems, in Social Psychology, Sociology, Criminology, Political Science and Anthropology. Projective tests are also used as a technique for measuring achievement motivation for personnel selection as a test of decision making, creativity, imagination and perception.

Nature of Projective Tests

The projective tests are relatively unstructured and the task permits an unlimited variety of possible responses. The test stimuli are generally vague and ambiguous and allow for a free expression into individuals' fantasy. The underlying hypothesis is that the way in which the individual perceives and interprets the test material will reflect the fundamental aspects of his psychological functioning. Thus a person's unconscious operations of the mind are brought to a conscious level in a disguised and projected form, and the person projects his characteristic thought processes, needs, anxieties and conflicts. Typically projective instruments represent disguised testing

procedure and attention is focussed on composite picture of the whole personality rather than on separate traits. They are the covert, latent and unconscious aspects of the personality.

Characteristics of projective methods

The stimuli provided in projective tests and usually diffused, vague and capable of arousing different kinds of responses. For example an ink blot might be perceived as a bird with stretched wings by one subject and as two girls holding each other's hands by another subject. A picture might arouse totally different responses from two individuals according to their characteristic background, one person may perceive the man in a picture as very harsh, cruel and merciless, while another person may call him an ambitious, planful and methodical individual. A set of dolls could be arranged as members of a family or as an army ready to march. There are no right to wrong answers nor is a respondent forced with limited alternatives. The emphasis is on the respondent's perception of the material, the meaning given to it, the way in which a respondent organizes or manipulates it. The individual is not asked to talk directly about himself or herself and the stimuli are not presented very clearly. Similarly the purpose of the test or nature of possible responses is not specified. The ostensible subject matter is the ink-blots or the pictures or the dolls. It is possible that a subject may attempt to give a totally different version of his natives especially when he knows the purpose for which he is being tested.

The responses given on various projective tests are so unconscious that the trained psychologist can easily find out the true nature of the individual. Moreover the individual's responses on projective tests are never taken on the face value which the subject would probably expect them to have. On the contrary the responses are interpreted in terms of some pre-established psychological conceptualization. This underlying conceptualization provides framework for interpreting the responses and arrive at a psychologically coherent picture of the individual.

Rorschach Tests

One of the most frequently used projective techniques in the clinical settings is the Rorschach ink blot test. This consists of ten cards. On each card there is a copy of an ink blot. The subject is asked to look at the inkblot and tell, "What this might be". This test was first developed by a swiss scientist Herman Rorschach and was used for diagnostic investigation of the personality as a whole. This test studies the imagination of an individual. It is also used as supplementary test to study mental retardation, artistic and other scholarly qualities of an individual.

On each of the Rorschach cards is printed bilaterally symmetrical inkblots. Five of the blots are shades of grey and black, two contain additional touches of bright red and the remaining three combine several pastel shades. An examinee is shown each inkblot

and is asked to tell what he sees—what the blot could represent. After the presentation the examiner questions systematically regarding the parts and aspects of each blot to which the associations were given. In usual application of Rorschach major emphasis is placed on the final global description of the individual and the psychologist integrates results from different scores and indices, such as interview, other tests, case history records etc. A major complicating factor in the interpretation of Rorschach scores is the total numbers of responses known as response productivity. However, the practice of considering the absolute number of responses can be misleading.

There is an empirical fact that response productivity appears to be closely related to age, intellectual level and amount of education. Rorschach technique is applicable in both research and clinical practice. For example the scores can help in determining signs of developmental level, hostility, anxiety and brain disfunctions. Goldfried Stricker and another have presented a systematic survey of available data on norms, reliability and validity for a number of specific applications in both research and clinical practice. Each application is accompanied by a thorough and well balanced evaluation of its strength and weakness. The authors conclude that while several of Rorschach indices have demonstrated enough validity to justify their use, the research, their suitability for clinical use has not been sufficiently established. They also conclude that the Rorschach appears most promising when used as a direct method of cognitive style and perceptual organization. However the results are not very encouraging when Rorschach is used to elicit fantasy productions. Rorschach is considered applicable from pre-school to adult level and large number of normative studies are available. Levitt and Truunmaa (1972) have published a summary of 15 normative data for children and adolescents. Ames and her co-worker have published norms for age groups 2 to 10 years, 10 to 16 years and on older persons beyond 70 years. The Hotzman inkblot technique is another standard technique of psychometric instrument modelled after the Rorschach.

The Thematic Apperception Test (T. A. T)

The T. A. T. material consists of 19 cards containing vague pictures in black and white and one black card. In contrast to inkblot techniques the T. A. T. presents highly structured stimuli and requires more complex and meaningfully organized verbal responses. This test was first developed by Murray and his staff at the Howard Psychological Clinic. The T. A. T. is not only widely used in clinical practice and research but has also served as a model for the development of many other instruments.

The subject is shown each card and is asked to make up a story to fit each picture, telling what led up the event shown in the picture, describing what is happening at the moment, what are the characters feeling and thinking and what the outcome would be. In

the case of the black card the subject is instructed to imagine some picture on the card, describe it and then tell a story about it. The original procedure of Murray consists of giving two one hour sessions. In each session 10 cards are employed. The cards reserved for the second session are more unusual, dramatic and bizarre and the instructions urge the individual to give free play to their imagination. Usually clinicians do not give more than 10 cards selected are such that the respondent can identify with one of the human figures in the card.

The interpretation of responses is usually based on content analysis of a rather qualitative nature. The examiner determines who is the "Hero" and what are his characteristics. The content of the story is then analysed to find out what are the main needs of the hero and what are the predominant presses (environmental forces) which may facilitate or interfere with the satisfaction of needs. Some of the needs measured are, achievement affiliation, aggression, nurturance, succorance, deference. The environmental forces that can be measured are: being attached or criticised by another person, receiving affection, being comforted, exposure to physical dangers such as fire, earthquake, shipwreck etc. In assuring the importance or strength of a particular need press for the individual, special attention is given to the intensity, duration and frequency of its occurrence in different stories as well as uniqueness of its association with a given picture. The assumption is that unusual material which departs from the common responses for each picture is more likely to have significance for the individual. Atkinson has published normative information which provides a general framework for interpreting individual responses. The normative data deal with Themes developed by the subject, the way in which each card is perceived, the roles ascribed to the characters, emotional tones expressed, speed of responses, length of stories, etc. A number of qualitative scoring schemes and rating scales have been developed. But their applications are rather time consuming, they are seldom used by a clinician, who relies heavily on subjective norms built up through his own experience with the text.

The T.A.T. has been used extensively in personality research, and many adaptations of the T.A.T. have been developed for special purposes. Several versions of the T.A.T. have been prepared for use in attitude surveys, attitudes towards labour problems, minority groups, schools, and authority groups, schools, and authority, other adaptations have been developed for use in vocational counselling, executive appraisal, and a wide variety of research projects. T.A.T. forms have also been developed for special populations including pre-school children, elementary school children, adolescents, crippled children, and various national and ethnic groups. Some adaptations are focussed for intensive measurement of a single need such as aggression, or sex; Mclelland used it for need achievement. Veroff and others have suggested the use of T.A.T. for national survey of achievement. There are specially designed sets for use of children

in the age groups 3 to 10 years called as Childrens Apperception Test (C.S.T.) developed by Ballack. These cards give animal pictures instead of human beings because it is assumed that young children project more readily to animals than human beings. These cards are designed to evoke fantasies relating to problems of feedings, sibling rivalry, parent child relations, aggression, toilet and other childhood experiences.

The Verbal Techniques

Although all projective techniques require verbal responses, the verbal techniques are wholly verbal, utilizing only words both for stimulus and for response. These verbal techniques presuppose thorough familiarity with the language in which the test was developed and minimum reading ability. However they can be used with illiterates by reading aloud the stimulus material. One of the verbal techniques is word association test which was originally used as free association test. The test consists of presenting a series of disconnected words and the subject is told to respond by giving the first word that comes to his mind. Originally the word association technique was stimulated largely by psychoanalytic movement. Later on Rapaport and his associates adapted this technique for general orientation. It consists of 60 word list associated with psychosexual conflicts. According to the authors the test had a dual aim. To aid in detecting impairment of thought processes and to suggest areas of significant internal conflicts.

This technique can also be used as a lie detector. The responses words analysed for content analysis, reaction time, and response disturbances are explored as indices of lying or guilt. Some time psychological measures of emotional excitement are obtained concurrently with the verbal responses. The word list chosen for lie detection is quite purposive and its effectiveness varies with specific circumstance under which it is used.

Another verbal projective technique is sentence completion. This method is widely employed for both clinical practice and research. The opening words or sentence stems permit a large variety of possible responses. These sentence stems are formulated to elicit responses that are relevant to the personality under investigation. One such sentence completion test is "The Rotter Incomplete Sentence Blank" consisting of 40 sentence stems. Each completed sentence is rated on a seven point scale according to the degree of adjustment or adjustment. Rotter has provided illustrative completions corresponding to each rating. These specimen ratings provided in the manual are fairly objective. The sum of individual ratings provides a total adjustment, score that can be used for screening purposes. Another specialized word sentence completing test is constructed by the Washington University Sentence Completion Test by Luevinger which reflects level of age-development such as presocial, impulsive, self protective conformist, conscientious, autonomous and integrated.

Picture Frustration test

This technique first developed by Resensweig gives series of cartoon pictures. There are adult as well as children form and Indian adaptations are also standardized. It consists of 24 sets of pictures in pair. In each pair there is a picture of a frustrating situation accompanied by verbal remarks. A blank space provided for the respondent to write answers what the frustrated person would reply.

The responses are classified with reference to the direction of aggression and type of aggression. Direction of aggression is scored as extrapunitive, (aggression turned outward on the environment) intrapunitive (turned inwards on the subject) and impunitive (turned off in one attempt to evade the situation or gloss over it). The type of aggression includes obstacle dominance, emphasizing the frustrating object, ego defence, focusing attention on the constructive solution of the frustrating problem. In scoring this test the percentage of responses falling into each of these categories is compared with the corresponding normative percentages. A group conformity rating showing a tendency to agree with the modal personality may also be obtained.

The P.F. being highly structured, limited in coverage, and relatively objective in its scoring procedure lends itself better to statistical analysis than many other projective tests. The P.F. like other projective instruments has been adopted by investigators for research on variety of problems. Such as attitude towards minority, group, consumer response to products, reactions of disabled towards their disability.

Projective methods in the study of social attitude

When the focus of investigation is on a specific characteristic or on the content of an individual's attitudes toward some social object, rather than on the person's general personality structure, projective techniques in the form in which they are used in the study of personality are not very helpful, yet projective approach becomes frequently desirable to evoke a state of freedom and spontaneity of expression. This is specially applicable when a respondent cannot easily evaluate or describe his motivations and feelings or when the respondent may hesitate to express his true opinion directly, or when the respondent feels that you are invading on his privacy. Several clever techniques have been developed for use in such situation. These techniques share some of the characteristics of the projective methods such as free response, no direct questions about himself, arousal of many reactions etc. Yet the responses are taken as reflecting his own views and attitudes. The test materials usually provide a more specific subject matter focus, for example, the individual may be presented with a picture which he is told represents a union meeting or with a cartoon in which leader is giving orders to a group.

It is necessary to take some general precautions, so that the main topic is not quite apparent. For example a fictitious purpose may be ascribed which appears plausible in the light of what is demanded of the subject, or some neutral or unrelated stimuli may be included along with the relevant stimuli. This technique has the advantage that people feel it easier to express themselves if they are not talking about their own feelings and attitudes. They feel a certain sense of security in not having to say in so many words that this is how they themselves feel. Secondly, even when they have the best of intentions, the subject may be unable to describe their feelings and attitudes as accurately as they may be describe in the projective test situation. Thirdly, some time access to the potential subjects (workers in an industry) may be withheld if the topic under investigation is made explicit because that may lead to some unpleasant knowledge about the institution.

The projective techniques designed for the study of social attitudes vary in the effectiveness with which they mask their purpose such as richness of the stimuli, expenditure of the skill and effort etc. Nevertheless these techniques proved a rich information without involving into complicated content analysis of the response material.

Play Techniques

Techniques involving the manipulation of dolls have frequently been used in studying children's attitudes. Dolls are useful in studying how people use space and distance interrelationship to others. Little (1968) used the spatial placement of dolls and figure silhouettes to study social interaction. Little concluded that the use of doll silhouettes in free placement provides sensitive and reliable methods for not only assessing the *themata* themselves but also marked individual differences that characterize them.

Evaluation of projective techniques

It is evident that projective techniques differ widely among themselves, some appear more promising because of the empirical findings, sound theoretical orientation or both. There are certain points which apply to a greater or lesser extent to the bulk of projective techniques. These points are considered here briefly.

(1) *Faking*: Although projective tests are less susceptible to faking, it cannot be assumed that these tests are completely immune to faking. Several experiments with the Rorschach, T.A.T. and other projective tests have shown that significant differences do occur when subjects are instructed to alter their responses so as to create favourable or unfavourable impressions.

(2) *Applicability*: Most projective techniques are effective means for overcoming the initial resistance. The tests tend to divert the

individual's attention away from himself and thus reduce embarrassment and defensiveness. They are especially useful with young children, illiterates, and persons with language handicaps.

(3) *Examiner and situational variables*: Most projective techniques are inadequately standardized with respect to administration as well as scoring. This is evident that even subtle differences in the phrasing of questions or the relationship between the examiner and the subject can appreciably alter the performance of the subject. Some examiners might be more encouraging and others more threatening. Such differences are likely to produce varied responses and effect the test results. There is also a certain lack of objectivity in scoring. The final evaluation and integration of the raw data depends on the skills and clinical experience of the examiner. Thus the results obtained by different examiners may not be comparable. The most disturbing implication is that the interpretation of scores is often as projective for the examiner as the test stimuli are for the examinee.

(4) *Validity*: Any test is valid when it measures what it purports to measure. Validity is the fundamental prerequisite for any test. Most of the projective techniques are inconclusive about the validity because of the procedural deficiencies in either experimental control or statistical analysis, or both. There is the danger of spurious relationship which may give an illusion of validity. There is also tendency to rely on clinical experience as a contrast group to compare the performance of the examinee. This is not a very healthy practice because the normal subjects should not be compared with clinical subjects. Some investigators have used a matching technique to overcome this defect. In this technique personality descriptions derived from test records are compared with descriptions or data about the same subjects taken from case studies, psychiatric interviews or long range behavioural records.

(5) *Reliability*: Since the projective tests are relatively unstructured and unstandardized scoring procedures and inadequacies of normative data, scorer reliability becomes an important consideration in projective testing. A proper measure of scorer reliability should include not only the more objective preliminary scoring but also the final integrative and interpretative stages. This is because examiners who have mastered a certain technique can not always agree on certain points. There is evidence that interpretations by different examiners on identical records have revealed marked divergencies. This is because there exists a fundamental ambiguity about the contribution of the interpreter's skills. Other types of reliability have proved equally poor in projective feeling. Coefficients of internal consistency have been usually low. The possible solution would be to construct a parallel form that is comparable. Retest also presents problems, because with long intervals genuine personality changes may occur and with short interval a retest may show just a recall of the previous responses. Thus the problems of reliability and validity can not be solved satisfactorily.

(6) *Norms*: Another conspicuous deficiency of most of the projective instruments is the availability of norms against which the performance of a certain subject can be compared. The data are either completely lacking, grossly inadequate or based on grossly inadequate population. The absence of standard norms forces an investigator to fall back on his general clinical experience. But such a frame of reference is subject to the possible distortions of memory and/or reflections of his own theoretical bases, preconceptions and other personal inadequacies. This may give misleading picture. Moreover since a clinician is predominantly dealing with maladjusted and pathological cases, he lacks sufficient familiarity with the characteristic reactions of normal people. Interpretations of projective tests requires sub-group norms. These sub-group norms which may have been developed on characteristic diagnostic groups, may lead to faulty interpretations.

Criticism

In general, the promise of projective techniques, according to many reviewers and critics, has not been fulfilled. The years of training required to become expert in the use of many projective methods, and the time involved in their administration, scoring and interpretation, raise issues in regard to the efficiency and economy in the use of projective techniques. Moreover psychologists feel that such techniques are often used to elicit information more readily available through other methods such as standardized interviews or observations.

Perhaps the severest criticism that can be made of the current projective techniques is the lack of a specified scientific model for their structure which can rise to testable hypotheses for probing the tenability of both hypotheses and model. Consequently most researches are of ad-hoc variety.

Survey

M. Ramchander

F. D. Vakil

Survey method, if conceived of in very general terms, is nothing but the general method of filling data materials keeping in consideration the scientific exactitude within the permissible limits. Many research problems require the systematic collection of data from populations or samples of population through the use of personal interviews or other data gathering devices. These studies are usually called surveys, especially when they are concerned with large or widely spread out groups of people. When they deal with only a fraction of a total population, a fraction representative of total, they are called sample surveys.

The basic survey procedure, as used in the social sciences, is made up of a combination of techniques which have been developed in various disciplines. The procedures of interviewing, for example, are based largely on the experience of psychologists, anthropologists and others who used personal interviews both as a research tool and as a means of diagnosis therapy long before it was adopted for survey use. Techniques of scaling and other methods of measurement have been borrowed from both sociology and psychology. Sampling methods have come in part from agricultural economics. Techniques of statistical analysis of mass data are common to all fields of quantitative research in the social sciences.

Survey method is one of those techniques in social science research having its own pattern of logical credibility. To put it in a language which may appear unsophisticated, it is a method with specific procedures for discovering answers to questions through research.

The data collection method, called survey research, is derived from the common intellectual operation of asking people how they feel about things and what they intend to do. Survey research is used to describe and explain the attitude and behaviours of relatively large number of people by administering questionnaires to relatively small parts of samples of the larger groups. Herbert McClosky defined survey "as any procedure in which data is systematically collected from a population, or a sample thereof through some form of direct solicitation, such as face to face interviews, telephone interviews or mail questionnaires". The problems of survey research,

therefore, are essentially, what questions to ask, for what kinds of information and how to ensure that the samples chosen are representative of the larger group or population.

Routine data collection is not survey, e.g. census is not survey since it is concerned with narrow descriptions whereas survey is interested in explanation of facts. Surveys are not the only devices social scientists can use to collect systematic data on populations. They can also consult for example ecological reports for information on consumption, industrialisation and other indices of modernization, state and country publications for aggregate data on party registration and voting preferences, on census and other government reports for figures on population changes, income levels, etc. The utility of these sources however is severely limited. Aggregative data for example can tell us very little about attitudes and motivations of the population, official election returns can furnish only a crude estimate of which groups have voted for whom and comparisons of gross voting figures in various elections cannot specify which of the voters have shifted their preferences for a candidate or party from one election to the next. These and scores of similar questions can usually be answered only through surveys. Surveys are the only instruments through which desired information can be obtained more easily and less expensively, when compared to other sources. Thus the use of survey research facilitates the accumulation of information on the values, attitudes and behaviours of individuals in different groups of population. The underlying purpose of such investigations is to determine what kind of relationship exists between sociological and psychological variables—between such factors as age, sex, religion, education, occupation or income. Survey research can tell us something about qualitative comparisons such as what kinds of people do and do not participate actively in politics.

If we trace the history of survey research methods, we can find three important phases in its development as a method of research. In the first phase which lasted till 1930 mere collection of data was considered survey. In the second phase, i.e. from 1930 to the II world war descriptive studies based on survey data was known as survey method. In the third phase i.e. after II world war the explanation part was considered as most important in the survey methods. This holds good even today.

Characteristics of Survey Methods

When the purpose of the study is accurate description of a situation of an association between variables, accuracy becomes major consideration and a design is needed that minimises bias and maximises the reliability of the evidence collected. Survey method as a technique of research can fulfil the above demands.

Survey method has the following characteristics:

1. First, it deals with a representative sample of population i.e. probabilistic sampling is essential to survey studies. Sample selection must be conducted in such a way that the data collected in the survey will enable us to describe and generalise about the entire population, not simply those members of the population who happen to fall in the sample. The important criterion here is that the sample be representative of the population that we wish to describe. The sample must be selected in such a way that every member of the population has an equal chance of being selected. Then only we can definitely say that the sample is unbiased.

2. Secondly, it seeks responses directly from the respondents. There is always a direct interaction between respondents and the instruments.

3. Thirdly, since surveys usually are based on representative sample of population, hence inference must be made from the sample to the total population. Survey method involves large number of many respondents when compared with other methods of data collection.

4. Lastly, survey is conducted in the natural setting.

Since survey method covers large numbers of respondents and large area, it has become the dominant method of data collection in social research. It is very much evident that data collecting procedures in social sciences are heavily dependent on survey methods.

Procedures in Survey Methods

Four important stages are involved in survey methods viz., (i) selecting the universe in the field of study, (ii) choosing the sample from the universe which we have selected for the study, (iii) tools and methods that are used for collecting data, and (iv) analysis of the data that is collected from the sample to make generalisations.

Survey requires skilled workers to gather data which is of primary nature. Careful selection and training of interviewers is, therefore, of paramount importance. Careful preparation of questionnaire, and interview schedules, (instruments) is another important factor. As the survey method is used to cover a wider geographical area involving varied languages, races, cultures, etc., translation of questionnaires, interview schedules to suit the local requirements assume importance. Similarly the interviewer should be trained, apart from in the methods of interviews, in the local dialect, intonation, etc., to suit the cross-cultural requirements. Organisation and supervision of field investigation are also of prime importance.

Collection of data through survey methods rests on basically two types of surveys: (i) Interview survey and (ii) questionnaire survey. Both the procedures have their own advantages. Questionnaire method is likely to be less expensive, ensures uniformity of measurements, enables the respondents feel free to express views, and it

places less pressure on the subject for immediate response. Advantages of interview method are that it can be used with almost all segments of the population and ensures a highly representative sample of population. Its flexibility helps to ascertain the changing meaning of responses, and offers better opportunity to appraise validity of reports. Further it is more appropriate technique for revealing information about complex, emotion laden subjects or for probing the sentiments that may underline an expressed opinion, and allows one to measure the varying social pressures under which the behaviour occurs.

Procedure of Questionnaire Survey

1. We collect information on the attitudes, behaviours and backgrounds of a population by administering a questionnaire to the members of the population chosen as sample. Before preparing the questionnaire it would be ideal to review pertinent literature which would help in framing questions that would cover different dimensions of the problem. In any type of research it is imperative to get reliable and valid answers, but right questions are to be asked. The task of formulating the specific questions to be asked is not an easy one. Several different types of decisions must be made in relation to these questions. Most important, questions must query those kinds of behaviours and attitudes in which we are interested and they must be neutral in structure. How questions are structured can often influence the responses. Questions which prejudice the response are hardly appropriate vehicles for scientific investigation. The arrangements of the questions constitute an important issue in questionnaire survey. As a rule it should start with questions soliciting simple, broad, factual, public information and proceed to questions eliciting complicated, indirect, attitudinal and private information. This is known as functional or reversal pyramid procedure. The idea behind this procedure is to induce the respondent to provide response in the beginning, by which chances of completing the questionnaire may become brighter.

Finally, preparation of instrument also involves responses categories and pre-coding, here the researcher must decide for which question response categories must be provided and how many categories should be used. Precoding refers to the inclusion on the questionnaire the numerical codes that are to be used in the eventual coding of responses and in converting them to machine readable cards or tapes. Precoding on the questionnaire can save time and reduce efforts in the processing of responses for data analysis.

The final stage of the survey is the administration of the questionnaire. This may be done by direct personal interviews, by mail or by telephone. If we use one of the latter two ways, our response will be limited both as to the number of people who will respond and in terms of the kinds of questions which may be asked. The personal interview is the most appropriate and most satisfactory means of

carrying out a survey, especially when we have a large number of questions to be answered. A telephone survey may result in obtaining one or two answers but usually no more because most people simply do not like to answer questions on the telephone. Mail questionnaires are often not returned even if a self-addressed stamped envelope is included with the questionnaire. Besides, in mail questionnaire we cannot have follow-up questions and there is no chance for further probing.

Interview Technique

This type of survey takes many forms, ranging from strict formal interview in which the interviewer follows strictly instruction provided by the researcher and in no way varies the procedures or helps the respondent in formulating and verbalizing his responses, to the completely open ended, in depth interview in which the interviewer actually changes mode of questions in the hope of getting a deeper understanding of opinions, and attitudes.

This type of survey demands decisions and adjustments from the researcher. Unless detailed planning and careful execution are carried out, the results may be disastrous rendering the data useless.

While the questionnaire and interview methods are standard survey methods, there are other methods which are variations of basic techniques of a survey method. The following are some of the other methods in survey research:

(A) *Telephone Interview*: This approach is very popular in West, obviously because of the development of the communication system and low cost. Under this method the respondents can be reached quickly and information can be gathered while recall of the news or information is still fresh. This type of survey could be useful only when respondents can be located through telephone directory. In India where majority do not have telephones this method would not be of great use in conducting research.

Though it is quick and involves less expenditure there are certain handicaps in this method. The interview is too short and the interviewer cannot ask too many questions. Follow up questions are not possible and the sampling is always biased since telephone is a symbol of affluence in developing nations.

(B) *Group Survey*: This is a survey method which imbibes characteristics of the questionnaire survey and interview survey. The group survey takes place when a group of respondents, is gathered together and then either a questionnaire or interview method is employed. In group interview survey, interviewer reads all the questions and provides each respondent with an answer form on which the respondent has to record his responses. It is more economical than personal interview. Secondly, it eliminates possible biases under interview method. It facilitates obtaining information from even less educated respondents.

In yet another type of group survey questionnaires are passed on to the respondents and no interview is involved. The respondent proceeds as in the mail questionnaire situation. Advantages of this approach are that it provides opportunities for respondents to raise questions and interact with the researcher. It is also economical and time saving. Major drawback of the method is that group situation will fix the responses, and there is always a possibility of respondents turning hostile. Despite this drawback, this method has proved its usefulness.

(C) *Panel Survey*: Panel survey is a method which is a direct extension of a questionnaire or interview survey. Basic strategy in this method is to survey the same group of respondents repeatedly over a period of time. Advantages of this method are that it allows the researcher to observe and assess changes if any which take place among respondents over the time period. There is continuity in the flow of data. It provides an opportunity for the researcher "to ascertain causal orders among the different variables". These two assets make panel survey a most desirable method. The panel survey has its own limitations. It is more costly and time consuming. There is always the problem of exposing the respondent to the same instrument repeatedly. The multiple exposure may result in sensitising the respondents to the instruments and thus introduce bias in their subsequent responses.

Problems of Survey Method

Several problems are common to most of the survey methods. Foremost problem is the response rate or the non-response rate. In survey method it is imperative that the sample maintains its representativeness which may be affected severely or even fatally when a substantial portion of respondents fail to participate in the survey. But then there is no fixed rule regarding what constitutes the proper response rate, and there are also different opinions about how a response should be calculated. There is yet another problem of direction of one's own perception and judgement. The survey method concerns the interaction among the instruments, the respondents and the interviewer. Such interaction generally induces the respondent to take a neutral position or fall in line with the more commonly held opinion. Similarly untrained or inexperienced interviewer tend to record responses in the direction of their own perception and judgement. Another problem of survey method is that there is a static element or lack of dynamism. Survey method, as Nan Lin points out, presents 'frozen slice of reality' since data is collected at one point in time. In essence, the data do not consider time as an intrinsic variable relating to frozen slice of reality". Besides there are other elements that contribute to the errors in survey methods. They are the particular point time of data collection and the auspices under which the data is collected. These limitations can be overcome by supplementing the data collected by survey method by other research methods. To avoid the errors further, the following

procedure is recommended: firstly, repeat the reliability checks, secondly, determine whether expected relationship appears or not. The expected relationship comes only when the respondent gives real replies. Thirdly, restructure the questions so as to get real replies. Lastly, compare data with data collected by other agencies.

The sequence of the tasks involved in carrying out a survey from the first stages of planning to the preparation of the final report involves the following stages:

1. *General Objectives:* The problems which make a survey necessary and the general objectives of the survey are stated. This usually involves the statement of the scope of the project in broad terms and defines the general area of the project.

2. *Specific Objectives:* The specification of all data to be gathered and of the hypotheses to be tested by the survey is mentioned at this stage.

3. *Sample:* At this stage two decisions must be made regarding the survey sample: (1) What the universe of the survey is to be, and (2) The size and design of the sample which is to be drawn. After these decisions are made the actual drawing of the sample units and the preparation of delineated ways, block lists and the like may proceed.

4. *Questionnaire:* The method by which the sample respondent is to be contacted is determined and a questionnaire is prepared. It is to be built carefully with regard to the type of questions to be asked, the degree of probing, the sequence of questions and the establishment of rapport.

5. *Field work:* When personal interviews are to be conducted, interviewer must be trained both in general interviewing procedures and in questions specific to a survey. A careful supervision of the field work yields good results.

6. *Processing and Analysis of data:* After the collection of data the next stage is processing and analysis of the data. At this stage the data is processed and analysed keeping in view the objectives of the study. The techniques of the processing and analysis are determined basing on the types of results required.

7. *Report Writing:* At this stage the report is written embodying the survey findings.

This scheme of the sequence of survey should not imply that the seven stages are independent of one another. Some of the steps listed in succession are usually carried out simultaneously. The survey process is a highly interconnected chain of events. Decisions at each stage must be congruent with what has gone before and must anticipate what will follow.

Conclusion

Social science methodology today heavily depends upon survey methods in its research activities. Survey research often is the sole way of retrieving information about a respondent's past history. It is one of the few techniques available for the study of attitudes, values, beliefs and motives. Survey research has had its broadest application in attitudinal research on consumer products and public issues. Its main visible success and failures have been in public opinion polls. In recent years survey research has also had a great impact on political research especially in the area of voting studies. Survey techniques have been used to study legislative and administrative behaviour. Electoral behaviour, community behaviour, the process of political socialisation constitute additional areas where the use of the survey technique has been quite fruitful.

It is not an exaggeration to point that this method is the only method where generalised information could be collected from almost any human population. But then it is also said that survey research method is an inappropriate tool for the study of multitude. The critics of the method say that individual respondent is placed outside the social context and a collection of individuals cannot be treated as a group. Nevertheless, in spite of its limitations this method is still the most popular way of collecting data.

Sampling

M. P. Sastry

Statistics is an inductive science. As an inductive science it collects limited data from a population and after studying that limited data or sample data it gives certain inferences about the characteristics or parameters of the population. For example if we want to estimate the average height of persons in Delhi, we collect a sample of heights and after studying that sample using statistical techniques we estimate average height of persons. Similarly after studying a sample of bulbs from the bulbs manufactured in a firm we estimate average life of bulbs. In a region after studying a sample of households we arrive at average income of households and so on.

Thus statistics can be defined as a science dealing with methods of selecting a sample from a population, methods of analysing sample data, drawing valid inferences about the population or testing some hypotheses about the population.

In popular terms a statistician can be compared to a judge, who is given certain information about a quarrel (situation) in the shape of evidence (partly hostile or incorrect) and he evaluates that evidence (sample) with the help of techniques of law and finally gives judgement (inference) about the case in hand. Certainly if the evidence (sample data) is wrong, his judgement suffers to some extent even though in an impartial way he applied legal techniques to the available data. Thus not appreciating this difficulty people in a loose way tend to blame a judge. Statistician also is a victim to popular misunderstanding and is often blamed by even very responsible persons even though his inferences are the correct outcomes of the data collected and given to him in the form of a sample. Thus if the sample or data collected is defective the inferences drawn from it are bound to be wrong. The fault is not of the statistician but it is the mischief of the data or the investigator who collected it. A statistician is not an alchemist who may make gold out of worthless material, but just interprets what is contained correctly in the data.

If a population is to be studied we naturally think why we should study a part of it and then estimate the characteristics of the population instead of studying the entire population. In many cases it is difficult in terms of money, accuracy, time and lack of personnel to study the entire population. If we consider the example of cloth

requirements of households in Delhi, one method is to contact each household to know its cloth requirement and then by adding the requirement of all households we get the total requirement. But then first of all we must have a list of all households, trained persons to contact all households, money required for the entire operation and sufficient time to complete the survey. This type of collecting information from all units of a population is usually called *Census Survey*. As we can easily see for Government this information about total cloth requirement is urgently needed to prepare its budget. Mistakes are bound to occur in collecting information on such a large scale when so many enumerators are involved. The expenditure will be enormous and the objective of the survey i.e., to have the information in a short period is not served. This apart, collecting large quantities of data from the entire population is wasteful when a smaller amount of data is sufficient.

As such there is need or necessity of collecting information from a part of the population, called sample. In a sample survey we collect information from a part or sample of the population. Naturally we take a short time, spend small amount and commit lesser mistakes in collecting information since we contact limited number of households employing well trained enumerators. But if the sample is not a representative of the population it is quite possible we get a biased estimate of the total cloth requirement i.e., if we get in our sample households of lower income group only, the cloth requirements of these households will be small and as such the estimated total cloth requirement will be an underestimate. Thus there is need to use statistical sampling techniques to get representative samples from the population under study. Sampling allows, as Goode and Hatt observed, for more adequate scientific work by making time of the scientific worker count. Another value is that it saves time and money and thus makes investigations possible which could not otherwise be undertaken.

We can say that in many cases sample surveys are to be preferred to census surveys provided we use statistical sampling techniques to get a good sample of the population.

The main objective of any sampling procedure is to secure a sample which, subject to limitations of size, will reproduce the characteristics of the population as closely as possible. Sampling procedures can be compared to a mirror which gives a reflection true to the original. Goode and Hatt define sample as a smaller representation of larger whole. Nan Lin defines it as a subset of cases from the population chosen to represent it. By using the characteristics of the subset, we can infer the characteristics of the population.

Thus by sampling we try to get a statistical image of the population. There is no particular method of sampling which can be considered as best, but considering the information available about the population and the restrictions imposed a nearly best sampling procedure can be evolved.

Sampling methods can broadly be divided into two types: probability samples and non-probability samples.

I. PROBABILITY SAMPLE

In this method it is possible to state in advance the probability that any given unit will be included in the sample. Once such a probability model is set up a mechanical procedure is devised to select elements from the population in accordance with the probability model. The main advantage of this method is the complete elimination of human bias in picking units from a population. The probability model is set up having in mind (i) the type of the population, (ii) characteristics of the units of the population and (iii) objectives of the survey. Since the sample is chosen according to a probability model the error that is likely to be committed by the inductive inference from sample to the population is called 'sampling error'. Unlike the bias in a non-probability sample, sampling errors can be estimated and usually the random sampling error of the estimated decreases on average as the sample size increases.

Since the sample is chosen on a probability basis we can always get a good estimate (estimates which are unbiased, consistent, efficient and sufficient are called good estimates) of population characteristics together with its standard error. We can give a confidence interval for the unknown characteristic which we are estimating. Various hypotheses about the population can be tested using statistical techniques. This is not possible with non-probability samples. To fix the correct probability model for a survey an experienced statistician must be consulted.

1. Simple Random Sampling

A method of selecting a sample of 'n' units out of 'N' units of the population such that every one of the possible samples has an equal chance of being chosen is called simple random sampling and the sample obtained by using this method is called 'simple random sample.' But some writers call this sample as 'random sample' also.

The actual mechanism of selection of units into the sample is called the 'sampling scheme'. There are different sampling schemes for taking a simple random sample. At this point we may distinguish between two types of simple random sampling. We may select the units into the sampling successively after replacing the selected unit before the next draw in which case the sample obtained is called simple random sample with replacement. In this method a unit once selected may repeat again. If the units selected are not replaced before the next draw, and drawing of successive units are made only from the remaining units of the population at any draw, then the sample obtained is called simple random sampling without replacement. In this method a unit once selected is put aside and thus will not be duplicated.

On the basis of statistical efficiency simple random sampling without replacement is preferred to simple random sampling with replacement.

The most basic type of simple random sample selection is to number all the sampling units and writing all these N numbers one on each of N slips of paper and selecting ' n ' slips out of N slips after thorough shuffling. The units with numbers in the selected slips is the required sample.

The above procedure of numbering each of the units of the population and then selecting ' n ' slips from ' N ' slips is cumbersome when the population is large. Also thorough shuffling may not be possible in practice. Human bias of taking slips also cannot be avoided. To avoid this difficulty we can make use of random number tables. In this method also we first number all the units of the population from 1 to N giving one and only one number to each of the unit. If N is a number which has ' k ' digits, by referring to the random number table we write down ' n ' ' k ' digit random numbers less than N successively. (In the sampling without replacement if a particular random number already noted repeats it will not be taken again. On the other hand if it is with replacement repeated number also will be taken again). Eg., let us suppose that we are to select a committee at random consisting of 6 people from among the participants of a course. If we wish to select by method of simple random sampling, we number all the 25 participants as 01, 02, ... 25. The value of N , the population size is 25 which is a two digit number, we are now to note down 5 two digit numbers from a random number table.

We have given below a sequence of two digit random numbers noted from a page selected at random and starting at random point. 61, 44, 65, 22, 01, 67, 76, 23, 57, 58, 54, 11, 33, 86, 07, 26, 75, 76, 64, 22, 19, 35, 74, 49, 86, 58, 69, 52, 27, 34, 91, 25, 34, 67, 76, 73, 27, 16, 53, 18, 19, 69, 32, 52, 38, 72, 38, 64, 81, 79, and 38.

(Source: Fisher & Yates, *Statistical Tables for Biological, Agricultural and Medical Research* (6th ed.), Cols. 21-22, p. 139.)

If the sampling is without replacement we note down the first six distinct numbers which are less than 25, viz., 22, 01, 23, 11, 07 and 19 and the units bearing these numbers form the required sample. On the other hand if it is with replacement, the units to be included in the sample are those which are numbered 22, 01, 23, 11, 07 and again 22, i.e. the unit numbered '22' will be represented twice in the sample.

2. Stratified Random Sampling

If the N units of the population is first subdivided in certain (say k) number of non-overlapping groups of $N_1, N_2, \dots, N_k$ units each and selection of sample is done independently from each

group, then it is called 'stratified sampling and groups are called strata. The sample sizes in strata are denoted by $n_1, n_2, \dots, n_k$, and the total of all sample sizes in different strata will be equal to the required sample size 'n' i.e. $n_1 + n_2 + n_k = n$. In particular if sample units in each stratum are selected using simple random sampling method then it is called 'Stratified random sampling'.

Usually the stratification is done to reduce the variability of the strata estimates which is achieved by forming the strata in such a manner to make the strata homogeneous within themselves with respect to the variate under consideration.

There are very many other reasons for stratification. Some of them are:

- (i) Sometimes it may be administratively convenient to stratify the population so that the conduct of the survey in each stratum may be looked after by separate agencies for separate strata.
- (ii) Depending on the nature of data, in different strata and they may be later combined for the whole population.
- (iii) The demarcation of strata and allocation of total sample size to different strata may be done in such a manner that the final estimate is more efficient from the point of view of sampling variability and cost.
- (iv) We may have to resort to stratification if we require the estimates with different errors in different parts of the population.

Sometimes it may be convenient to stratify the population on geographical basis also.

For example let us suppose that we are interested in getting an average income per household in Hyderabad on the basis of a sample of size say 100. If we adopt simple random sampling method it is possible that the sample obtained may contain all the rich households or poor households only. In which case the estimate may be very high or very small. On the other hand if we stratify the population on the basis of the assets the household possesses, the estimate obtained may be more precise.

With stratified sampling there are various problems. Some of them are:

- (i) Choice of suitable sampling method within different strata,
- (ii) The number strata into which the population is to be divided, and
- (iii) Demarcation of strata and determining the views of N_k .

3. Cluster Sample

Cluster sampling is a type of sampling in which clusters of units are selected in the sample instead of elementary units. This technique is particularly useful when basic sampling frame of all elementary units is not available. Further with cluster sampling field work cost is comparatively low. However, except under some particular conditions, sampling with clusters is less efficient than sampling with elements.

A sampling procedure in which the sampling unit is a cluster of elements and after selecting a sample of clusters information is collected on each element in the sampled clusters is called cluster sampling. For example instead of selecting a sample of an individual in Tirupati from the list of all individuals of Tirupati town we may select a sample of households (families) and then collect necessary information from each member of the sample households. In this case the sampling cluster is household. In an all India survey instead of selecting a sample of individuals from the entire country, we may select a sample of villages (urban blocks in towns and cities) and then conduct census in the sample villages or blocks. Here the sampling cluster is village or equivalent urban block. Similarly for selecting a sample of students in university hostels, we may select a sample of hostel rooms and collect information on each inmate of the sample rooms. In this case the sample cluster used is the hostel room.

The sample of clusters can be selected by using any one of the basic sampling designs. For e.g. we may select a simple random sample of clusters or a systematic sample of clusters or simple random samples of clusters from each stratum of a stratified population of clusters.

Advantages of cluster sampling are:

(1) When sampling frame of all elements is not available we can resort only to cluster sampling. This is often the case in practice.

(2) In cluster sampling the field work gets localised or concentrated, as on contacting a cluster information is simultaneously obtained on all the elements of the cluster whereas in sampling by elements there may be wider scattering of elements in the field of operation. As such field cost for collecting data with clusters is comparatively cheaper. Further the field work period will also be lesser.

(3) Cluster sampling is economically cheaper.

The disadvantages of cluster sampling are:

(1) Usually the elements within a cluster are similar, as such in cluster sampling the cross-section of the population represented in the sample is less compared to sampling by elements.

(2) Because of (i) above, the efficiency of cluster sampling is also less compared to sampling by elements.

(3) As often happens, usually in practice the clusters are of unequal sizes (like size of household, population of villages, population of agriculturists in villages etc). In such cases building of estimates of parameters and their standard errors are somewhat difficult.

4. Multistage Sample

In cluster sampling discussed above, we have considered census in each sampled cluster. As all the units in a cluster are usually similar, we may resort to only subsampling in each sampled cluster. Such a sampling technique in which we first take a sample of clusters and then do subsampling in sampled clusters is known as multistage sampling. Because of the tremendous advantages of multistage sampling designs, these designs are usually the designs used for sampling in large scale surveys.

II. NON-PROBABILITY SAMPLE

Representative, purposive, judgement, quota, accidental samples can be called non-probability samples, since the common feature of getting above mentioned samples is not based on the probability with which a unit can enter the sample but by other considerations such as common sense, experience, intuition and expertise. The main defect of such samples is that they are 'biased' samples. While selecting units unconscious errors of judgement, personal likes and dislikes, the attitude of the person sampling and so on will enter and what is worse is that there is no objective way of assessing the magnitude of these errors.

1. Representative Sample

Many procedures based on intuition and commonsense are suggested to take a representative sample. The sample selected in general represents a characteristic variable and may not represent the population with respect to other variables. If we take as a sample of a school students, the pupils in the first grade won't represent the school w.r.t. age whereas they may represent the school w.r.t. colour of the eyes. Thus there is no precise meaning to the term 'Representative sample'. The bias of the sample can never be determined and there is no way of applying statistical techniques to get a good estimate of population characteristics since the sample has no probability basis.

2. Judgement sample

In this a person responsible for taking the sample after considering all the units of the population makes a judgement selection of

some units to form his sample. Such a person must have long experience in conducting surveys, correct grasp of the objective of the survey, the variable under consideration and an unbiased attitude in order to use his judgement. However it is inevitable that bias will enter the sample and since there is no probability basis, good estimates cannot be prepared.

3. Purposive Sample

When a population can be divided into a number of groups and each group is consisting of some units, to get a sample of units, in the first stage some groups are selected and then from the selected groups some units are selected finally.

To get purposive sample in general we choose some groups, which we feel represent all the groups considering the purpose of the survey. Then as in the quota sampling method, investigators are allotted to all the selected groups to select and interview some units from these groups such that their quota is accomplished.

Thus in this method bias is included in two stages without any way of assessing that bias.

4. Accidental Sample

Another non-probabilistic type of sampling is accidental sampling. In this a researcher selects any case he comes across. For example, if one wants to study the behaviour of police, the researcher stands outside the police station and asks the opinions of those who come out of the police station about police behaviour. This method is adopted to survey quickly public opinion. In this it is not possible to know whether the sample is representative or not.

5. Quota Sampling

Quota sampling is a type of stratified judgement sampling. As it uses the benefits of stratification and as it is very simple to use this sampling method, it is quite often used in practice by many agencies when sampling results are very quickly needed with small budgets.

We have seen in stratified random sampling that from a stratified population, samples of prefixed size are taken from each stratum using probability sampling techniques. In contrast, in quota sampling, samples of prefixed size are taken from each stratum of a stratified population using judgement sampling techniques. Each enumerator of the survey is allotted a quota of units to be selected from each stratum and in quota sampling the enumerator fills his quota in each stratum by taking advantage of any information that enables him to cover his quota quickly and cheaply. He selects representative and quickly accessible units according to his personal judgement in each stratum using prior information such as that rich

people seldom live in slums and poor people are rarely found in posh localities.

Advantages of quota sampling techniques are:

(1) Quota sampling derives the benefits of stratification without the high field costs that might be incurred in an attempt to select units at random.

(2) Not much technical knowledge of sampling theory is necessary to use this method of sampling.

(3) Varying amounts of latitude can be permitted to the enumerators to select the sample quickly and cheaply.

(4) In this technique the personal advance knowledge and contact the enumerator has with the sampling units can be fully exploited.

(5) The estimates can be obtained very quickly and cheaply.

Disadvantages of quota sampling techniques are:

(1) Theory of sampling cannot be applied to quota sampling methods as these do not contain any element of probability in the selection of the sample.

(2) Information about the precision of estimates through quota sampling methods cannot be obtained.

(3) The reliability of the estimate is not known and hence confidence limits cannot be set for the parameter.

(4) As such, it is dangerous to use quota sampling methods without sufficient experience in such surveys.

Suppose it is desired to conduct a socio-economic survey on certain group of people. Then each investigator is allowed free to choose their respondents provided his quota shall contain so many men and women, so many of high income and so many of low income and so many of each profession like employees, businessmen, agriculturists etc. Each investigator can complete his field work quickly with less travelling and halting allowances and further without going through technical process of selecting random samples.

In public opinion polls in assessing political attitude to various parties and in gauging the reaction of people to a Government's policy decision, quota sampling methods are very useful to get results quickly.

III. OTHER SAMPLING PLANS

1. **Snowball Sampling**

In some cases information about units within the population is not available. In such cases the snowball sampling method is

adopted. If the researcher wants to study the problems faced by Indians in London he would contact all the Indians in London who could be located. Those contacted would be asked to give the names of other Indians in London. By repeating the process in several stages a majority of Indians in London could hopefully be identified and contacted. From this group a sample would be drawn.

This method is useful only when all the target group maintain contacts between them, and the group is willing to reveal the names of others. But the serious limitation of this sampling is that those who could not be located may have peculiarities, in which case the study gets biased.

2. Spatial Sampling

Some populations are not static; they move from place to place staying at a place while an event is taking place. In such a case, the whole population (wherever possible) at a particular place are taken into the sampling and studied.

3. Saturation Sampling

Certain activities require that all members of the population need to be studied so as to get a picture of the entire population. The sampling method that requires a study of all population is called saturation sampling. In sociometric studies this technique is adopted. In such studies even if one person is left out, we get distorted results.

The above mentioned are a few recently developed sampling plans which are different from the more traditional ones. Each sampling plan has its own merits and limits. Keeping in view the needs and requirements and to ensure maximum representation of the population the researcher can choose any one or a combination of sampling methods.

Measurement

P. Sandeep

M. Pushpa

Concept of Measurement

By measurement we mean the process of assigning numbers to some population of objects or events in accordance with some set of rules. This process is usually described as mapping objects or events into an abstract space of some particular structure defined by rules and represented or described in terms of numbers or other symbols. To Russell "measurement of magnitudes is, in its most general sense, any method by which a unique and reciprocal correspondence is established between all or some of the magnitudes of a kind and all or some of the numbers, integral, rational or real as the case may be" (1938). To Campbell, measurement is "the assignment of numerals to represent properties of material systems other than number, in virtue of the laws, governing these properties" (1938). To Stevens "Measurement is the assignment of numerals to objects or events according to rules" (1951). In spite of the difference in treatment, they are dealing with the same general problem, which concerns the process and rationale involved in the construction of a scale or measuring device and the properties that can be ascribed to it.

The method of analysis defines what the information is and may or may not endow this information with certain properties. For example, to construct unidimensional scale a strong method of analysis endows the data with properties which permit the information in the data to be used. Therefore, it is necessary to study methods of collecting data with respect to the amount and kind of information each method contains about the behaviour in question as distinct from that imposed. Similarly it becomes desirable to study the various methods of analyzing data. All of this is a subject of greater concern in the social sciences than it is in many other domains of knowledge. Thus in a more traditional way measurement pertains to properties of objects, and not to the objects themselves. Hence measurement of a property involves the assignment of numbers to systems to represent that property.

Process of Measurement

Nominal Scale: When measurement consists only in mapping of objects into symbols, the symbols constitute a nominal scale. A nominal scale has certain properties which may be formulated abstractly as axioms. For example either the relation of "equal to" or "not equal to" must hold between objects of a nominal scale. This means that any pair of objects must clearly belong to the same class or not belong to the same class. This level of measurement is so primitive that it is not always recognized as measurement, but it is a necessary condition for all higher levels of measurement. The mapping of individuals into such classes as athletes, politicians, Negroes etc., are examples of stereotyping and constitute nominal scales.

The Ordinal Scale: Beginning with a nominal scale and finding a relation to hold for some pairs, one can construct a partially ordered scale, a higher level of measurement. If one finds that the relationship holds for all pairs of objects from different classes, one can make an appropriate change in the axioms to convert a partially ordered scale into a simply ordered scale or what is usually known as the ordinal scale. A "Natural" ordinal scale is obtained when the same data themselves contain the relation "greater than" for pairs. Let us take "authority" to mean "who bosses whom" and represent this by the familiar relation "greater than". If individual B commands a platoon and individual A commands the company which includes that platoon, then A B. By such a means, a simple order along a chain of command can be formed.

The Interval Scale: The interval scale is characterized by the fact that the data contain information on just how large the intervals between all stimuli on the scale are. Operationally this condition is satisfied by the existence of a common and constant unit of measurement. In such a case members may be associated with the positions of the stimuli on the scale such that the operations of arithmetic may be meaningfully performed on the differences between these numbers.

In an interval scale, the numbers associated with the points on the scale are "right" only within a linear transformation. For example any given number can be added to all the scale scores and the relations between intervals will be preserved. This is called "translation" and corresponds to the fact that the origin, the location of the numerical value "zero" is arbitrary. The ratio scale is an interval scale with the additional characteristic that the origin is an absolute zero and not an arbitrary zero.

Hence it is evident that the process of measurement consists in part of selecting a level of measurement, an abstract system into which the data are to be mapped. Social scientists have used a great variety of techniques and procedures for collecting and analyzing data.

Survey Measurement

In survey measurement, we must take elaborate precautions in preparing, conducting and analyzing. As such, the pre-test shows the extent of success anticipated for the main study in terms of interviews, measurement and operations. In survey measurement, we often do not know the respondent's frame of reference for choosing to answer a question to evade it or for not knowing. A variety of interviewing tactics have to be revolved by the pre-test, if not before. Typically surveys rely mostly on one pre-test. It attempts to answer the obvious problems with questionnaire measurement e.g., question difficulty, ambiguity, impartiality and irrelevance.

However for any study in any setting, the researcher must have deep and realistic cultural insight into how people live and the tools, customs and practices that are their technologies for survival. For the specific purpose of developing one interview schedule there are various formal techniques. Anthropologists and sociologists have been principal exponents of participant observations, whereby the researcher lives and moves as a member of the social unit he is studying.

"Social indicators" (Bauer 1966) provide a broad survey of the major measures of social description in continuing use. Shaw and Wright (1967) have compiled some 200 attitudinal measures in eight substantive areas: social practices, social problems, international issues, abstract concepts, political and religious systems, ethnic and national groups, significant others, and social institutions. It should be noted that any particular scale may be the mixture of different kinds of measurement. A common occurrence in social and behavioural sciences is for the order to be determined fundamentally and intervals to be defined in terms of operational meaning of the characteristics. Speed test would be an example of the situation. All the scales lead to a considerable number of procedures which have been devised to enable researchers in social and behavioural sciences to determine scale values of a series of objects, events or individuals with respect to some attributes. The procedures differ from one another in several different aspects namely, the properties of the scale, discriminability amongst the stimuli, nature of the response field of specialization, latent or manifest data and experimental procedures like the rating methods, method of paired comparison, method of rank order etc.

Attitude Measurement

One method of ordering people on scales of behaviour, attitudes and information is Guttman Scaling (Guttman 1950) which assumes the presence of one rank-order dimension when more than one dimension underlie the data, 'errors or deviations' from the scale pattern occur more often than expected by chance. The problem

now is that only rarely have the attitude scales, personality inventories, or skill and aptitude tests developed in industrialized societies been appropriately modified and validated for the vastly different socio-cultural setting in which they are more indiscriminately used.

For the investigator who must create his own interview measures, there is a considerable accumulation of general principles and specific procedures for the preparation of questions, scales or sets of questions and questionnaires (Payne 1951, Kahn and Cannell 1957; Richardson, Dohrenwend and Klein 1965). These will help in achieving validity in measurement. The achievement of reliability depends on the same basic principles, but is particularly enhanced by specifying the exact wording of the questions to be asked in the interview, etc.

In social research, the actual conduct of an interview is only a part of the measurement process. It has been the key instrumental process for social scientists. The total process would include at least the following five steps.

- (1) Creating or selecting one interview schedule (set of questions, statements, pictures, other stimuli to evoke responses) and a set of rules or procedures for using the schedule.

- (2) Conducting the interview (that is evoking the response or events that are to be classified).

- (3) Recording these responses (by means of paper-and-pencil notes, electronic equipment or other devices).

- (4) Creating a numerical code (that is a scale, or other system of numbers into which the recorded responses are to be translated) and a set of rules for making the translation.

- (5) Coding the interview responses.

To assess and improve the quality of measurement by means of interviewing, we need systematic answers to the adequacy of measurement, adequacy of the chosen conceptualisation and the remedies to such inadequacies. In all but its most extreme and indirect forms, the interviewing technique is ultimately dependent upon a societal record of individual protection, respect for the confidentiality of personal data and relevant and benign use of information.

The interview is an improvement over the questionnaire and can be more powerful than a questionnaire without arousing suspicion. In this regard Aronson and Lindsey (1965) reported an experiment which failed when the dependent variable was measured by a questionnaire but succeeded when the subjects were interviewed by a person who was of course, unaware of the subjects' experimental treatment.

The questionnaire and the interview are often valuable. Moreover behavioural measures are not always perfect. A specific segment of behaviour can be multiply determined, thus behavioural measures and questionnaire measures, even though they may appear parallel, occasionally tap different things.

Most researchers use classical Psycho-metric theory and certain varieties of scaling theory (notably Thurstone's and Guttman's) in recent attempts to precise attitude measurement. Though not enough is known about the relative adequacies of these procedures, Psychometric theory is the most elaborately developed and its methods for instrument construction and analysis are somewhat easier. It is possible that extension of Psychometric theory and method, particularly in the elaboration of factional components and moderator variables, will improve the usefulness of this model of attitude measurement.

Likert has suggested a technique for arriving at a score on an attitude questionnaire which is a simple extension of mental testing technique. The technique is to take a statement of opinion sufficiently extreme so that it cannot act non-monotonically—that is, so that there are not likely to be any people so extreme that they would reject the item for not being sufficiently extreme. To such an item, a degree of endorsement is obtained, typically from 'strongly agree' to 'strongly disagree'. The problem of arriving at scale scores on an interval scale has conventionally been treated primarily as an empirical problem and by means of statistical criteria—e.g. reliability, validity etc. The level of measurement into which the data are cast is an intrinsic part of any theory about the data. If a given set of data should actually satisfy only a partial order, it can always be mapped into an interval scale by defining a constant and common unit of measurement. Such a scale will usually exhibit a significant degree of reliability in the score of a sufficiently high ratio of the variability between the individual scale position to variability within. In such a circumstance, statistically significant relation can be obtained with other similarly defined variables and hence these procedures have tremendous practical value for applied problems.

Bogardus carried out a systematic work first on the measurement of inter-group attitudes. His basic method was a paper-and-pencil questionnaire (social distance scale). Bogardus included as "races" ethnic and nationality groups of many sorts, such as Canadians, Chinese, English, Scotch, Scotch-Irish, Serbo-Croats, Hindus, German Jews etc. Since Bogardus' investigations, many other methods of attitude measurement have been devised, and scores of articles and even books have been written about their respective merits. Major approaches to the measurement of ethnic attitudes were reviewed by Deri et al (1948) and by Cook and Selltitz (1964). Campbell (1950) has published a useful review of disguised and indirect approaches.

Problems in Measurement

Some of the criteria for judging the acceptability of measures are (1) Reliability—the degree to which measures produce the same results over time; (2) Sensitivity—the degree to which measures detect actual differences; (3) Dimensionality—the degree to which measures lie along a single underlying continuum; and (4) Validity—the degree to which measures reflect the attributes they are supposed to measure.

The two problems of measurement that are most important are ambiguity and reliability, that is, the meaning of measurement and the consistency of measuring over time.

Ambiguity is the fundamental problem of measurement at any level, both the ambiguous assignment of quantitative values to qualitative characteristics and the ambiguous interpretation of their meanings. The rules for assigning numbers must be detailed and clear in order to categorize each object in one category or another with a minimum of doubt. The problem of exclusive categorical definition exclusively becomes increasingly complicated and meaningless clear as we move up the levels of measurement that graduate values on an assumed continuum of say, low to high or bad to good. Even at the simplest nominal level of measurement, ambiguity is a frustrating problem.

To reduce the ambiguity of measurement, researchers attempt to define, isolate and adequately measure individual dimensions underlying specific attitudes or behaviour. When we assume one dimension as isolated, the measurement problem is to develop procedures which assign a number to each quantity of the attribute in such a way that relations between the numbers reflect analogous relations between the quantities (Torgerson 1958). If left unresolved through intensive preparation of measurements, good pre-testing, tight field control and interview verification, ambiguity can be particularly devastating, when the later data analysis rests on naive assumptions for the validity of the assignment of numbers.

Measurement reliability has been defined as 'constant results' when repeated under conditions taken to be constant (Kaplan 1964). Constancy is probably too restricted for the reality of large-scale surveys. The major sources of error confounding reliability area (1) unequal respondent groups, which affect all sub-sampling reliability measurements, (2) changed conditions from difference in interviews to differences in the respondent's situation, which affects all test-retest reliability measurement, (3) memory, which particularly affects test-retest measures with the same instrument, (4) multidimensionality which affects all test-retest measures with the same or equivalent instruments and (5) unequivalent measures which affects equivalent forms/split halves measurement at high or multiple points in time.

However, for solving the problems of measurement, pretesting, where all parts of the study really come together as a whole in the reality of field conditions, help to the maximum extent. It also provides an opportunity to improve measurement. The problem of establishing a rule of correspondence for relating a construct to observable data reduces to the problem of devising rules for the measurement of the construct.

There are three approaches to the measurement problem: (1) The subject-centred approach where the systematic variation in the reactions of the subjects to the stimuli is attributed to individual differences in the subjects. (2) The stimulus-centered or judgement approach where the systematic variations in the reactions of the subjects to the stimuli is attributed to the differences in stimuli with respect to a designated attributes, and lastly (3) the response approach where the variability of reactions to stimuli is ascribed to both variations in the subjects and in the stimuli. These three approaches are mainly for the area of attitude measurement.

However, the use of any particular technique of measurement, very much depends on the nature of research and the type of data that individual researcher would seek to examine.

Sociometry

P. Sandeep

The origin and development of sociometry are intimately linked with the contributions of J.L. Moreno. Although similar devices were used before, the important first step in the development of sociometry was the publication of *Who shall Survive?* Moreno's original study was of a large closed community, but current research more frequently involves smaller closed groups, temporary experimental groups, two person interactions and even artificial groups. There are also applications of the techniques in large groups and open communities. Sociometric techniques merge into general methods of systematic observation.

Nature of Sociometry: Sociometric devices are ideally equipped to function in a field where there is much interest in cross-disciplinary integration. Sociometric method is most easily applied to person objects, but it could also be extended to other objects, such as nations and institutions. It requires the person to choose from a list, those objects with which he would most like to relate in a specified context. It is easy to conceive of the sociometric test as a variety of rating scale—the members of the group are asked to rate or order other members of the group in terms of their attractiveness or desirability for sharing certain activities.

What is a sociometric measure? It is a measure of assessing the attractions and repulsions within a given group. It usually involves each member of the group privately specifying a number of other persons in the group with whom he would like to engage in some particular activity and a number of persons with whom he would not like to participate in the activity.

Moreno has advocated some important requirements of the sociometric test: (1) the limits of the group should be indicated to the subjects; (2) the subjects should be permitted an unlimited number of choices or rejections; (3) the subjects should be asked to indicate the individuals they choose or reject in terms of specific criteria; (4) results of the sociometric questions should be used to restructure the group; (5) the subjects should be permitted to make their choices and rejections privately without other members of the group being able to identify the responses; and (6) the questions used should be gauged to the level of understanding of the members of the group.

Among several techniques, some measures of sociometry deserve consideration:

1. *Sociometric self-rating or relational analysis* is an extension of the sociometric test which involves the use of sociometric self-rating or prediction of one's sociometric choice, for example "Who do you think will choose you?" This method was first mentioned by Moreno (1942) which was elaborated by Tagiuri (1952) under the title of "relational analysis" and has indicated its usefulness in the study of social perception. A further step has been to ask subjects to guess all the sociometric choices of all members of the group. The accuracy with which the individual perceives the choices and rejections of his associates and the conditions under which systematic distortion of these perceptions takes place appear to be important additional variables in the sociometric situation.

2. *Scaling Methods*: Gardner and Thompson constructed a set of scales designed to elicit the individual's ratings of members of the group in terms of their capacity to satisfy the following needs: affiliation, playmirth, succorance and achievement, recognition. The scales involved a series of forced choice comparisons of group members and resulted in a rating on each variable from each subject, for each other member of the group. The authors presented evidence indicating that the scales produced approximately equal interval scores and that the ratings were satisfactorily reliable.

3. *Group preference record*: This is a variation of the sociometric techniques which requires the members of the group to respond in terms of like, dislike or indifference to every member of the group.

4. *Multirelational sociometric survey*: By this method, it is possible to establish a large number of meaningful indices for the classification of relational patterns in an organization. In this adaptation two classes of question (criteria) are utilized, that is organizational "goal-directed" and "non-goal directed". For each goal-directed activity five relations are investigated: (1) The prescribed; defined by leaders of the organization or the table of organization; (2) the perceived; defined by the subjects' reports of the prescribed relations; (3) the actual relations which the subjects report; (4) the desired; the relations normally ascertained by a positive sociometric test; (5) the rejected; the relations normally ascertained by a negative sociometric test.

5. *Estimate of time*: This procedure requires the investigator to ask the members of the group to estimate the proportion of time, given a finite limit, that they would like to spend interacting with the other members of the group in a given activity.

6. *Guess who technique*: This technique involves presenting the subjects with various behaviour descriptions and asking them to "guess who" among the members of the group this description best fits. This technique may possess some advantage over the sociometric

test in that it is slightly more indirect and the intent of the investigator is less apparent to the subjects.

Analysis of Sociometric Data: To analyse and represent social-choice data there are five methods, viz., graphical method, simple quantitative method, statistical method, matrix method and fractionation of groups.

Graphical Method: Moreno presented a method, the sociogram, for summarizing the choices and rejections among members of a group. It employs geometric figures to represent members of the group and various kinds of lines, joining the figures to represent choices and rejections. There is no single convention for the drawing of diagrams, but rather there are many alternatives available to the investigators. Its purpose is to discover group structure and the relation of a group member to the group as a whole. Proctor and Loomis developed an index of social distance based on the reciprocal relations between each pair of individuals in the group. The types of interpersonal relations are as follows:

- Type A: i chooses j and j chooses i
- Type B: i chooses j and j ignores i
- Type C: i chooses j and j rejects i
- Type D: i ignores j and j ignores i
- Type E: i ignores j and j rejects i
- Type F: i rejects j and j rejects i

The major intent of a sociogram drawn in this way is to cluster closely related persons and thus identify cliques. There is some danger, however, of this forced concentration, especially if the group is large and there is a high incidence of choices.

An appraisal of the utility of the sociogram must begin by noting its dramatic and compelling qualities. In many industrial and military applications, as well as in some educational settings, the "glamour" of the sociogram makes it almost a prerequisite, no matter what additional techniques may be used in analyzing and presenting sociometric results.

Simple Quantitative Methods: Sociometric data are summarized completely in the sociogram, but an equally complete method of the summarization is the $N \times N$ table or matrix, in which N refers to the number of subjects. This technique makes the summarization of the number of choices and rejections made and received by each subject by a simple task of adding across a column or down a row.

Scores and derived indices: Moreno's "who shall survive?" includes the explicit formulation of a number of indices and implicitly assumes a larger number. The identification of the "star", the "isolate", and the "rejected" provided the basis for a large number

of the individual indices later developed. Venable investigated friendship patterns in a group of college girls and defined a "star" as an individual chosen as next-friend by at least five others and an "isolate" as one chosen by no others.

The number of mutual choices in a group serves as the basis of several indices. Proctor and Loomis identified group cohesion as the number of mutual pairs divided by the possible number of mutual pairs in the group. The sum of acceptances plus the sum of rejections divided by one less than the group size, is an index which Mc Kinney identified as social intensity. Choice-rejection status is identified by Proctor and Loomis as the number of choices less the number of rejections received.

It is possible to consider choices and rejections simultaneously, by means of profiles. Jennings has dealt with profiles of individuals based on (1) choices made, (2) choices received, (3) positive reciprocations, (4) rejections made, (5) rejections received, and (6) negative reciprocations. The first three are given as the choice pattern, and the six together as the choice and rejection pattern. Essentially, the problem of what type of measure is proper in a given situation is defined by the comparability of the situation to other situations, the use to which the measure is to be put, and the types of assumptions the investigator is willing to make.

Statistical Methods: Statistical techniques are widely used in analysis of sociometric data both to test the significance of observed findings and to provide derived scores of indices. Bronfenbrenner developed the notion of a chance model, introducing the Pearson Type III curve as the most adequate approximation to the binominal expansion for sociometric data, and elaborated on the concept of statistical significance as applied to sociometric data. A special consideration in the use of Bronfenbrenner's method should be noted. Separating persons as significantly overchosen and significantly underchosen provides an aura of respectability in the handling of the data, but such a procedure may be unrealistic. Such classes are frequently very small and require a large number of samples of large samples to permit further statistical comparison.

Criswell's scoring procedures, in contrast to Bronfenbrenner's method, attempt to eliminate the influence of chance distributions. She devised a ratio, in which a given racial group's preference for itself over another racial group was expressed as follows:

$$\text{Group self-preference: } \frac{SO'}{OS'}$$

where S is the number of choices given by a group itself, S' is the number of choices it would give itself by chance, O is the number of choices the group gives to the other racial group in the experimental population and O' is the number of choices it would give by chance to the other racial group.

Another method for group coherence is group coherence

$$= \frac{\text{Number of reciprocated choices} \times q}{\text{Number of unreciprocated choices} \times p}$$
 where p/q is the chance ratio of reciprocated to unreciprocated choices.

Several attempts have been made to apply statistical methods in testing differential choice patterns within a group. Criswell was the first, who used chi square.

$$\text{Chi square} = \frac{(\text{Self-preference expressed-theoretical self-preference})}{\text{Theoretical self-preference}}$$

Reliability and Validity of Sociometric Data

The reliability of a measuring device is the consistency with which it measures or orders the variable in question and the degree to which a test is capable of achieving specified aims is defined as its validity.

Firstly, in order to obtain adequate reliability of measurement, *interjudge consistency* is a necessary prerequisite. With respect to purely graphical representations of the sociometric responses of a group, a great deal of subjectivity and individual decision making is involved, unless one of the detailed conventions is employed such as that recommended by Wright and Evitts. Secondly, it should be *consistent overtime*. Given relevant changes in the situation, in the individual being rated, or in the person doing the rating, changes in the sociometric measure would not only be expected but would be required as evidence of its adequacy. Thirdly where multiple criteria are used in obtaining sociometric choices, one may inquire into the consistency of responses on these alternate forms, i.e., consistency in equivalent forms of measurement is necessary. For example when Bonney, Hoblit and Dreyer asked college students for roommate choices and also for leisuretime, the two were substantially correlated (.50 to .73). Lastly, internal consistency is essential, where the investigator is using a cumulative sociometric score made up of the combined total of responses of two or more separate items.

From the numerous studies conducted some general trends about reliability of sociometric data can be noticed. They are as follows:

1. The sociometric position in the extreme categories, popularity and isolations tend to be more stable and more consistent in different situations. But the sociometric positions in the middle categories, below average, average and above average, are less consistent and stable over various situations.
2. The sociometric status of individual members of a group is far more stable than the structure of the group.

3. The use of fewer choices in sociometric tools results in less reliable, sociometric data. But the use of three positive and one negative or five and more choices tends to give similar sociometric results.
4. The larger the number of criteria in a sociometric tool, the more stable sociometric status scores.
5. The sociometric data based on specific criteria tend to be less reliable than the data used on the general criteria.
6. The stability of sociometric data declines as the time interval between the two administrations of the sociometric tool increases.

Further, if the sociometric investigator limits his interest to a measure of interpersonal choice, it is clear that the somewhat intelligent concept of face validity is equally relevant here. *Content validity* of a test is its adequacy in sampling the universe of situations that the test situation is supposed to represent. For example, academic achievement tests, in which the test constitutes a sample of a given field, a body of knowledge, and industrial performance measures, in which the test is a sample of the specific skills and activities required for a given job. Secondly, *criterion-related validity* is important when there is an identifiable criterion variable for what a list purports to measure, the test may be used to estimate an individual's present standing on that variable or to predict his future. Lastly, when a test is designed to measure some hypothetical trait or quality *construct validity* must be determined by the network of relationships between test performance and variety of relevant measures. Whenever the sociometric responses directed towards a particular individual are combined as a measure of his sociometric status, a generalized trait or quality is involved and construct validity is an appropriate concept. The most important is the general question of the extent to which it relates to significant independent measures that are of interest to the theorist and investigator.

Sociometric measures provide convenient means of estimating the extent to which groups are divided or disrupted by negative attitudes toward minority group members and that they provide a sensitive measure of the extent to which prejudice determines in individual's personal choices and rejections. It is also necessary to find how a sociometric measure can be constructed, analysed and interpreted. An illustration with the procedure can give an idea of preparing a sociogram.

Construction of the Sociometric Measure

Sociometric technique is a highly accurate technique with the added values of being easy in preparation, simple in use and speedy in administration. Some sample questions can be:

- (a) with whom would you like to sit?
- (b) with whom would you like to work?

- (c) whom would you like to have in the same club with you?
- (d) whom would you like least to work on a committee?

Sharma gives the following steps involved in designing a sociometric test:

1. The selection of the choosing situation—the sociometric criterion.
3. The determination of the number of choices to be used.
3. The wording of sociometric questions.
4. The development of directions and the format of the tools to bring out valid responses.

Kinds of Criteria: A knowledge of the following kinds of criteria may be helpful in selecting criteria for a sociometric tool.

(1) Socio criteria are collective in nature and imply a desire for social proximity such as working in a common work unit, living in the same room, etc.

(2) Psyche criteria are strictly private and personal in nature such as associating in leisuretime, playing cricket, solving science problems etc.

(3) Goal directed criteria are clearly related to organizational goals, which illustrate a goal directed criterion.

(4) Non-goal directed criteria are those where mutual choices are possible because the individuals are free to choose each other.

(5) Diagnostic criteria is to obtain information for research purposes or diagnostic purpose, the criteria used are only probabilities. e.g. 'Who are your best friends?' etc.

(6) Negative criteria: 'Whom will you least prefer as a seating companion' is an example of negative criterion. This helps for distinguishing between those who are simply not chosen and those who are actively rejected by the group.

If the purpose of the study is to evaluate interpersonal relationships of the members of a group, several criteria are generally necessary. But if the purpose is simply to put students into two or three sections, even one criterion may be sufficient. Regarding the number of choices, one, two, three or five is advantageous from psychological, practical and statistical view points. If seating companions are required two choices will be more appropriate for the situation.

There are certain characteristics of any sociometric tool that make it a desirable and useful instrument. The first consideration is to get the subjects to express themselves as spontaneously as possible in their choices of companions. Secondly, directions should be

clear about tools and situations and the methods of recording choices. Thirdly, it is important to emphasize the confidential nature of the choices made. Fourthly, the students should understand that it will not be necessarily possible for the teacher to give everybody the first choice of associate, but an effort would be made to see that each student would have a companion out of the choices given by him. Lastly, the word text cannot be used anywhere because it is, more often than not, associated with right and wrong answers and would probably distort the meaning of the choices to the students. For example a format can be:

(1) which three students from this classroom would you like to have as your seating companion?

(2) which three students of this classroom would you like to play with during recess in schools? When the instructions and directions have been well written, the teacher has to convey them meaningfully and with proper emphasis on each.

After the collection of data, it should be organized in such a manner that the results are usefully and economically obtained. A two-fold table called the 'Sociometrix' may be regarded as a convenient way of organizing the results. It can provide a wide variety of information.

Target Sociogram: is one of the group sociograms and has been found most useful and convenient for depicting the social structure of an entire group, each member's status in it and the predominant relationships among the group members. Northway designed Target Sociogram consisting of four concentric circles. He placed 'Populars' in the centre of the target and 'isolates' in the outside circle. Other group members were placed between these extremes according to the members of choices received by them. The target sociogram has been refined and improved by others (Bronfenbrenner 1944). Sharma (1975) feels that drawing concentric squares is more convenient than drawing concentric circles, because squared paper is easily available.

The following illustration will give a clear picture of plotting a sociogram.

Looking at it one can see quite quickly which students are 'on the outside', which are 'in the centre' and which have just average status. All of the reciprocal choices stand out the cleavages and sub-groups show up.

Populars: The class had three populars, one boy (roll 1) and two girls (roll nos. 15 and 16). All the three appear in the innermost square in the centre of the sociogram. They received more choices on the sociometric criterion that could be expected by chance alone. Roll nos. 1, 15 and 16 had received 1, 3, and 3, third choices respectively although the total choices received by them on first criterion were 6, 6 and 8 on all the three criteria 18, 19 and 23. The popular boy is indirectly attached to 9 students (4 boys and 5 girls) on

TABLE

Category	Number of Choices Received	Number	Boys' Roll. Nos.	Girls' Roll Nos.
Popular	15 and above	3	1, 1	15, 16
Above	10—14	7	4, 5, 7	17
Average			8, 10, 12	
Average	9	1		18
Below	4—8	4	3, 6, 9, 11	
Average				
Neglectee	1—3	3	13	19, 20
Isolate	0	3	2, 14	21

third choice. Both the popular girls are attached to all the girls indirectly as well as to boys each on third choice who is the real leader in the class? From the sociometrix it is seen that both the girls (roll Nos. 15 and 16) choose the boy (roll No. 1) on the first criterion as their third and second choices respectively and girl (roll No. 16) has mutual choice with the boy. The popular boy (roll No. 1) is thus indirectly attached to all the girls as well.

Isolates: The boys (roll nos. 2 and 14) and one girl (roll no. 21) are seen on the arm of the outermost square. They received no choices on any of the criteria.

Neglectees: One boy (roll no. 13) and two girls (19 & 20) received fewer choices than could be expected by chance. They are only slightly better than the isolates.

Rejectees: Both the boys (2 and 14) who happened to be isolates were rejected by their class fellows. Boy (14) has been rejected by 3 boys and 3 girls. And boy (R. no. 12) by four classmates—2 boys and 2 girls.

Average and above Average

The student who receives choices expected by chance (average) and those who received score between the expected value and the upper limit (above average) are also regarded as having satisfactory social relations and are called accepted pupils, 6 boys and 1 girl who belonged to above average category are placed in the square next to the innermost. One girl (18) who belonged to the above average category is placed on the arm of the second square.

Below Average: The students who received choices between the critical sociometric scores for lower limit and expected value are

classified as below average and are regarded as not having satisfactory social relations. 4 boys (3, 6, 9 and 11) who belonged to below average category are placed in third square, reciprocal choices. There are three pairs of fully reciprocated choices in the sociogram.

Cliques: When a number of group members choose each other on the same criterion, but give relatively few choices to individuals outside of their closely knit group, it is called a socio-metric clique.

Cleavage: When there is a lack of sociometric choice between two or more subgroups, then it is regarded as socio-metric cleavage. However, one needs to take some caution in interpreting the class sociogram.

Individual Sociogram: This is the graphic representation of the sociometric relationships of an individual member with other group members.

Research Applications of Sociometric Measures

Sociometry is important in social research in several ways. A few are listed below:

1. It deals with basic data in which social scientists are interested.
2. It has interdisciplinary popularity and appropriateness.
3. It has capacity to present individuals in a miniature social group.
4. It is easy to administer, takes less time, and requires very little resources.
5. It has implications for action research.
6. It arouses interests in participants.
7. It provides relatively acceptable indices for a large number of empirical concepts.

One of the most common uses of sociometric results is that of improving social relations. The individual method of improving social relations requires professional knowledge and skill and can be better employed by qualified counsellors. Thus, sociometry is highly useful in identifying leadership, small group behaviour, prejudice, research in educational process, attitudes, beliefs and values. Sociometric measures are also useful, for example in classifying individuals and groups.

Sociometry is a simple, economical and materialistic method of observation and data collection. It also has the virtue of considerable flexibility. If it is defined broadly, it can be adopted to a wide variety of research. The research weaknesses of sociometry lie in the individuals who have used sociometry. As Lindzey and Borgatta point out, there is a scarcity of systematic theoretical investigation. They also point out the inadequate attention paid to sociometric criteria and the inadequate treatment of sociometric data.

In the applied use of sociometric technique say, by the classroom teacher, the choice of criteria may be related to practical objectives. On the one hand the teacher may wish to restructure the group subsequently on the assumption that more effective work can be carried out by children when they themselves have selected their co-workers. Sociometric procedures have also been important to the development of several other research areas. For example, study of that impact of group structure on the characteristics of its members or on group consequences, such as efficiency of task completion or morale of the group, has made necessary a more formal development of notions of communication networks. They remain pervasive in the social sciences, having relevance to personality research, small group research, analysis of networks of communication and group structures, and to special topics such as the reputational study of social status in the community and the study of segregation patterns.

Thus sociometry has considerable potential usefulness as one important approach to the observation and measurement of variables. The student who contemplates using the method, however should study its rationale, its statistical limitations and its possibilities of mathematical analysis.

Scaling Techniques

B.C. Muthayya

Measurement concerns the assignment of numbers to objects to represent amounts or degrees of a property possessed by all of the objects. An important characteristic of measurement is its power to enable us to decide within limits which of the inexhaustible number of sets of numbers that might be assigned to the set of the objects is appropriate. The result of measurement is a scale which comprises the set of numerals given to the objects by using a certain rule of assignment. Objects may be measured according to many different rules, each of which leads to a scale with special properties. The scaling techniques have come into being because of a need felt by the social sciences to quantify the data which is otherwise qualitative in nature. The quantification of the data facilitates the establishment of scientific laws.

Stevens S.S. mentions four types of scales, namely, the nominal, the ordinal, the interval and the ratio scales.

A *nominal scale* is one that consists of two or more named categories into which objects or individuals or responses are classified.

The basic requirement for a nominal scale is that any one be able to distinguish two or more categories relevant to the attribute being considered and specify criteria, for placing individuals, in one or the other category. For example, the classification of individuals according to caste groups constitutes a nominal scale. Use of nominal scales is characteristic of exploratory research where the emphasis is, uncovering a relationship between two characteristics rather than on specifying with some degree of precision, the mathematical form of the relationship, or where the focus of the study is on the pattern of relationship among several characteristics of the person. An *ordinal scale* defines the relative position of objects or individuals with respect to a characteristic with no implication as to the distance between positions. The basic requirement for an ordinal scale is that one be able to determine for each individual or the object measured, whether that individual has more of the attribute in question than another individual or the same amount or less. In other words, one must be able to determine the order of positions. The numbers assigned in the ordinal scale do not provide

a definite indication of the distance between any two points. In ordinal scale, therefore, the scales are limited to statements of greater, equal or less but one cannot say how much greater or how much less. In an *interval scale*, not only are the positions of objects or persons arranged in terms of greater, equal or less but also the units or intervals of measurement are equal. In other words, the distance between positions labelled one and two on the scale is equal to the distance between positions two and three. In researches in social sciences, it has not been possible to devise procedures for many of the attributes that would give with reasonable certainty about the equality of the intervals.

Attempts however, have been made particularly in connection with the measurement of attitudes. The *ratio scales* in addition to having the characteristics of an interval scale contains an absolute zero. The empirical operations necessary to establish a ratio scale include methods for determining not only equivalence—non-equivalence, rank order and equality of intervals but the equality of ratios. This type of scale often called fundamental measurement is most commonly found in physics. In social sciences, attempts have been made to construct such scales in the field of psycho-physical attributes.

Coombs C.H. has proposed another classification of scales which includes all the four types of scales of Stevens and another scale which he calls as partially ordered scale. This scale falls between the nominal and the ordinal scale in which the objects are considered first and secondly, the distances between the objects are examined. The objects may be simply classified, may be partially ordered or may be completely ordered. The distances between objects may also be classified, ordered or partially ordered. This results in ordered-nominal scale, nominal-partially ordered scale, and partially ordered-ordered scale.

In most measurement situations in social and behavioural sciences, the raw data consists of a number of responses to each of the number of stimuli or stimulus combinations. There are three approaches to the measurement problem: The *subject-centered approach* where the systematic variation in the reactions of the subjects to the stimuli is attributed to individual differences in the subjects. The *stimulus-centred or judgement approach* where the systematic variations in the reactions of the subjects to the stimuli is attributed to differences in the stimuli with respect to a designated attribute and lastly, the *response approach* where the variability of reactions to stimuli is ascribed to both variations in the subjects and in the stimuli. These three approaches can be illustrated mainly by examples from the area of attitude measurement. The method of judgement through the use of equal appearing intervals of Thurstone for the construction of attitude scale is one of stimulus-centred approach where the task for the subjects (judges) is such as to minimise any variation due to their own position with respect to the

attitude. The Likert technique provides an example of subject-centered approach where the task for the subjects is such as to allow individual differences with respect to the attitude continuum to be expressed. The *responses* approach is that followed by Guttman technique of scale analysis. In this, an attempt is made to order both subjects and stimuli with respect to the attitude continuum. Both subjects and stimuli can thus be assigned scale values.

The subject-centered approach has not yet led, to any great extent, to the development of scaling models. The applications in general are examples of measurement of the variables as operationally defined. By far, the major part of the field of mental testing is based on measurement of this kind. Most aptitude, achievement and intelligence tests, where the individual's score is a simple or adjusted sum of the number of items answered correctly, are essentially examples of measurement by definition. It is interesting to note that in those areas where the primary interest is in scaling subjects, the change from measurement by definition to measurement by fundamental process has ordinarily involved a shift from the subject-centred approach to the response approach.

Attitude scales

The analysis made so far gives an idea of the different types of scales and their feasibility for social science research. Most of these attempts of scaling have contributed to the development of scales for the measurement of attitudes towards social issues. This attempt was to devise procedures whereby the individuals could be placed on an attitude-continuum. The attitude scales differ in the method of construction, method of response, and the basis for interpreting scores. Since the assessment of the attitude is a primary concern among social scientists, the remaining part of this paper devotes itself to a discussion of the attitude measurement in terms of the different types of attitude scales as developed by L. L. Thurstone, R. Likert and L. Guttman.

The attitude measurement consists in assessing an individual's response to a set of social objects or situations. This is done by observing a sample behaviour from an attitude universe. Each behavioural element in the attitude universe is the response to a particular situation or object. The particular situation or object that evokes the response together with the specified set of response categories is called an item. An item is a manifest variable. A number assigned to an individual's item response is an item score. A collection of items is called a questionnaire. The questionnaire is free from some of the connotations of the other terms like test, inventory or scale. A questionnaire may contain items from different attitude universe although usually a single universe is represented. A number derived from item response which represents a position on the latent variable is called a scale score or simply the score. The score forms the attitude scale. The scale implies a

system for obtaining a score from individual's item responses. The term scale is also occasionally used to refer to the scoring system.

Scaling always implies the existence of a continuum of some kind. Its nature must be inferred from the character of the items selected to make up the scale. The first step, therefore, in scaling procedure regardless of the technique employed is a thorough knowledge of the subject matter. It is also necessary to assume that every scale is composed of items which are only a sample of the possible universe of the items. Therefore, the scale construction requires a high degree of consciousness of the logical problems surrounding the twin assumptions—the existence of the continuum, and the representation of the responding continuum achieved by the particular scale. The question of representativeness is checked by tests of validity and the existence of a continuum can be empirically verified through various attitude scaling techniques. The reliability of the scale is also very important as it is a pre-requisite before the scale is administered to a larger population for any purpose.

A unidimensional scale measures a single variable. In general, the property of *unidimensionality* means that people with the same score have about the same attitude. Operationally, *unidimensionality* and *homogeneity* have essentially the same meaning. In general, if the items on a scale are highly interdependent, then the items are homogeneous and the scale is unidimensional. A homogeneous scale is, in general, a reliable scale. If a scale is reliable and homogeneous, it measures some variable. The problem of validity is to discover what it measures. The first problem in validation is to delimit and define this attitude universe. It is helpful to distinguish at least three kinds of attitude universes namely *elicited verbal attitudes* in terms of the respondents' opinion to a statement, the *spontaneous verbal attitudes* like the opinions expressed by individuals in normal conversations, and lastly the action attitude like the verbal and non-verbal behaviour expressed in a particular situation. Although most of our attitude scales measure *elicited verbal attitudes*, other scales are equally possible. This description will facilitate the assessment of the validity of the scale or the attitude universe. There are various known methods for assessing validity of attitude scales which are not discussed here.

In this paper four major scaling techniques would be briefly discussed namely the judgement methods, the method of summated ratings, scalogram analysis and rating scales.

Judgement methods

The judgement methods of attitude measurement are all variants of a technique developed by L. L. Thurstone and E. J. Chave. The technique requires dichotomous, non-monotone items having operating characteristics with single maxima. There are two major aspects of the judgement methods. First, the items must be scaled, i.e., each item must be given a scale value that represents its degree

of favourableness towards the issue. Secondly, the respondents must be scored on the basis of their responses to the items.

There are several methods of determining the scale value of items. If only a few items are to be scaled, the *method of paired comparisons* is appropriate. Here each one of the several judges, (preferably 25 or more) is presented with every possible pair of items and is asked which of the paired items is more favourable to the issue in question. For each pair of items, the proportion of times, one item was judged to be more favourable than the other is obtained. Therefore, if we have "n" statements and each statement is compared with every other statement, then the total number of pairs will be given by the formula:

$$nC_2 = \frac{n(n-1)}{2}$$

Several methods may be used as shortcuts in the situation including the method of rank order. The method of rank order or order of merits method is seldom used. In this method, each judge places the items in rank order of favourableness towards the issue in question. The scale value of an item is the weighted or unweighted average of the ranks given to the item by a group of judges. Alternatively, a paired comparison analysis can be used following the procedure developed by Thurstone.

The law of comparative judgement assumes that for a given stimulus, there is associated a most frequently aroused or modal discriminial process on a psychological continuum. A discriminial process is a theoretical concept and represents the experience or reaction of an individual when confronted with a stimulus and asked to make a judgement of some attribute. Thurstone also makes an assumption that the distribution of all discriminial process aroused by stimulus is normal about the modal discriminial process. The mean or median discriminial process associated with a stimulus is taken as a scale value of the stimulus and the standard deviation of the distribution of discriminial process is referred to as discriminial dispersion. The modal discriminial process and the discriminial dispersion for any given stimulus will, therefore, depend upon the particular attribute that is being judged. In the case of comparison between any two statements about the psychological object, the subjects are required to make comparative judgements as to the extent of favourability of a particular statement in relation to the other. In case there are two statements, A & B for which comparative judgements are to be obtained by a number of judges, where 50 per cent of the judges say that A is more favourable than B and another 50 per cent in the reverse direction, then the proportion of favourable judgement for each of the statements would be .50 which is the modal discriminial function. If we find more than .50 of the judges say that statement A is more favourable than B, then the modal discriminial process will be higher for A in relation to B. On the basis of the comparative judgements obtained, it is possible to

arrive at the frequency corresponding to the number of items, a particular statement is judged more favourable than the other. Based on the preferred frequency, it is possible to obtain the proportion of a particular statement being judged more favourably than the other. These proportions thus obtained can be expressed as unit normal deviate by means of the table of normal deviates. By adding up the unit deviations, and dividing by the number of statements in each row and adding a constant, the scale values are obtained for each one of the statements.

For large number of items, the methods of rank order or the paired comparison becomes unwieldy.

The *method of equal appearing intervals* is the most widely used of the judgement methods. It is much simpler in application than the method of paired comparisons since it requires only one judgement per item. The procedure for developing the scale is as follows: The investigator gathers several hundred items conceived to be related to the attitude being investigated, that is, the item must elicit responses that are psychologically related to the attitude being measured. It also requires that the scale differentiates among people who are at different points along the dimensions being measured. Secondly, a large number of judges, which could range from 50 to 300, working independently sort the items into fixed number of categories (usually 7, 9 or 11) that are arranged in the order of favourableness. For example the judge places statements which he considers most favourable in the first pile, the second most favourable in the next pile and the statement which he considers most unfavourable in the 7th or 9th or 11th as the case may be. The 4th, 5th, and the 6th positions as the case may be, depending upon the number of categories used, serves as a neutral position at which there is neither favourableness nor unfavourableness. The judge is usually asked to sort the items in such a way that the intervals between categories are subjectively equal. However, there is no way of determining whether in fact the intervals are subjectively equal which, by and large, remains an assumption of the experimenter. Now the scale value of a statement is compared as the median position to which it is assigned by the group of judges. Statements that have too broad a scatter as revealed by Q value are discarded as ambiguous or irrelevant. A final selection is made taking items that are spread out evenly along the scale from one extreme position to another. It is often possible to construct duplicate forms of the scale from items not used for the original form. Usually it is preferred that the final scale should contain around 20 items. The subjects in filling up the scale are either asked to check statements in the scale with which they agree or to check the 2 or 3 items that are closed to their attitude position. The median of the scale values of the items the individual checks is interpreted as indicating his position on a scale of favourable-unfavourable attitude towards the object.

In preparing statements for a scale of this type the following precautions should be observed: The statement should be as brief as possible so as not to fatigue the subjects. It should be such that it can be endorsed or rejected according to one's opinion. Every statement should be such that acceptance or rejection of the statement does indicate something. Double barrelled statements should be avoided. One must ensure at least a fair majority of the statements really belong to the attitude variable that is to be measured. There are some objections to this scale: First, that the amount of work involved in constructing it is not only cumbersome but time consuming. However, in view of the recent developments in time saving techniques, the amount of time and labour involved in constructing a scale by this method is not substantially different from other scales. Second, it has been mentioned that the scale values of the statements are not independent of the attitude of the judges doing the sorting.

There are several studies which revealed that the scale values assigned do not depend on the attitude of the judges. However, it has been found that judges of superior and low intelligence differed due to the interaction of attitude and intelligence bringing about some effect on the scale position of the items. Third, it has also been pointed out that the individual score is the mean or median of the scale values of the several items checked by the respondent. This results in essentially different attitudinal patterns being expressed in the same score. For example if items, let us say, one and two having scale values of 8.6 and 8.4 are checked, the median value will be 8.5. But in the case of an individual who checks items 1, 2, 3 and 4 with scale values of 8.6, 8.4, 10.3 and 3.8, the median value again will work out to 8.5. This suggests that basically both the individuals have a similar attitude in the favourable-unfavourable attitude dimension but the median score is constituted of different attitude patterns by virtue of the different types of items marked by the individual. Although this score has some of these defects, it has been found to be more useful in attitude assessment as it constitutes a reasonably satisfactory ordinal scale and provides a basis for saying whether one individual is more favourable or less favourable than the other.

The *method of successive intervals* was designed by Thurstone to overcome some of the difficulties inherent in the method of equal appearing intervals. Here also the procedure to obtain the scale values is the same as that for equal appearing interval scale, except that the latter do not require the judges to discriminate between statements placed within the same category. If a judge encounters a statement that he regards as extremely unfavourable early in the judging process, he will undoubtedly place that statement in the extreme category. Subsequently, if he encounters another statement that is more extreme than the first, then he may not have a category beyond the one previously used and hence he sorts the second

statement in the same category as first. He is not forced to discriminate between the two statements as would be the case in paired comparison. This method of successive intervals takes care of the possible inequalities in the widths of the intervals on the psychological continuum of a scale. This method requires like the method of equal appearing intervals a single judgement from each subject for each statement to be scaled. As mentioned, the procedures followed to obtain judgment and arrive at the cumulative frequencies are all similar to the method of equal appearing intervals. The scaling problem in this method is to determine estimates of the widths of the intervals making up the psychological continuum from the cumulative proportion distributions for a given set of statements. After obtaining the cumulative proportions for each of the statements, they are converted into the unit normal deviate by using the table of unit normal distribution. After obtaining the unit normal deviates, the difference between the successive entries (between 2 and 1, 3 and 2, 4 and 3, 5 and 4, 6 and 5 etc.) are obtained which indicates the estimates of the various interval widths. It is assumed that the best estimates in the widths of the various successive intervals are the arithmetic means of the entries in each of response categories for all the subjects. These means are the estimates of the width of the various intervals on the psychological continuum. The cumulative widths of the various intervals are obtained in order to achieve the psychological continuum. Once the knowledge of psychological continuum is achieved, it is a simple matter to find the scale values of the various statements. The scale values of the statements may be taken as the medians of the corresponding cumulative proportions of this continuum. The medians may be calculated by using the relevant formula. This will give the scale value for each one of the statements. However, this procedure described does not permit us to obtain an estimate of the width of either of the two extreme intervals. This is because no estimate can be obtained for the lower limit of the first interval or the upper limit of the last interval as the widths of these two intervals are indeterminate. For further information of the procedure, the reader is advised to refer to Edwards, A.

Method of summated ratings

The summated scale consists of a series of items to which the subject is asked to react. The type of summated scale most frequently used in the study of social attitudes follows the pattern devised by R. Likert and is referred to as Likert type of scale. In this scale, the respondent indicates his several degrees of agreement or disagreement with each item that constitutes the scale instead of indicating his agreement for only a few items. Each response is given a numerical score indicating his degree of agreement or disagreement based on a three-point or five-point response category. The sum of the scores of the individual responses to all the separate items gives his total score which is interpreted as representing his

position on the scale of favourable and unfavourable attitude towards the object. Thus one would expect an individual with a favourable attitude to respond favourably to many items, an ambivalent individual to respond favourably to some and unfavourably to others and an individual with an unfavourable attitude to respond unfavourably to many items.

The procedure for constructing the Likert type of scale is as follows: The investigator assembles a large number of items considered relevant to the attitude being investigated, either clearly favourable or clearly unfavourable. These items are administered to a group of subjects representative of those with whom the questionnaire is to be used. The subjects indicate their response to each item by checking one of the categories of agreement or disagreement. The responses to the various items are scored in such a way that a response which is indicative of a most favourable attitude is given the highest score. It makes no difference whether five is high or one is low in a five point response category or vice-versa. The important factor is that the responses should be scored consistently in terms of the attitudinal direction they indicate. Each individual total score is computed by adding his item scores. The responses are analysed to determine which of the items discriminate most clearly between the high scorers and low scorers on the total scale. The items which do not discriminate as measured by the discrimination power of the item between low and high scores in the scale, or items that do not show a substantial correlation with the total score are eliminated to ensure that the scale as a whole is internally consistent. That is, every item is related to the same general attitude. Sometimes it is also necessary to find out the inter-relationship among each of the items in the scale to assess the extent of homogeneity of the items that constitute the scale. This scale has certain advantages over the Thurstone scale.

It permits the use of items that are not manifestly related to the attitude being studied. This scale is generally considered simpler to construct and likely to be more reliable than a Thurstone scale of the same number of the items. The range of the responses permitted to an item given in this scale provides a more precise information about the individual's opinion on the issue referred by a given item. However, some of the disadvantages of the Likert type of scale are: It does not claim to be more than an ordinal scale, i.e., it makes possible the ranking of individuals in terms of the favourableness of their attitude towards a given object but it does not provide a basis for saying how much more favourable one is than the other nor for measuring the amount of change after some experience. Another disadvantage of the Likert type of scale is that the total score of an individual has little clear meaning since many patterns of response to the various items produced the same score. This is also true in the Thurstone type of scale but the extent of its occurrence is much more in this scale. Despite the lack of theoretical rationale for scalability, the scores on the Likert type of questionnaire provide

the basis for classification of people based on the characteristics measured. The selection of the items, the format of the items etc. are similar to that already mentioned while discussing the Thurstone's scale.

Cumulative scale or scalogram analysis

In a cumulative scale, the items are related to one another in such a way that ideally an individual who replies favourably to item 2 also replies favourably to item 1, one who replies favourably to item 3 also replies favourably to items one and two. Sometimes the items as they appear in the scale are arranged in the order of favourableness; sometimes they are arranged at random. Ordinarily, no attempt is made to determine whether the intervals between items are equal. Thus, in practice, cumulative scales are ordinal scales.

The general procedure for determining whether or not the responses of subjects to items form the scale is known as scalogram analysis. It is based on an analysis of the response patterns of the subjects to a set of items where a response pattern denotes the set of responses to items given by a subject. In practice, scalogram analysis can perhaps be most accurately described as a procedure for evaluating sets of statements or existing scales to determine whether or not they meet the requirements of a particular kind of scale as described by L. Guttman. For items of this "cumulative" type of scales as mentioned earlier, acceptance of one item implies that the person possesses enough of the attribute to accept all items of a lesser magnitude. When responses to a set of attitude statements meet this requirement that set of statements is said to constitute a unidimensional scale. Therefore, the first task in analysing cumulative scales is to ascertain the degree to which the initial set of items represents a single dimension which is inferred from the degree to which subjects respond with the admissible answer patterns (scale types). It is assumed that any non-scale pattern reflects one or more response errors. The number of response errors counted is the minimum number of changes required to convert a non-scale response pattern into a scale type. The total number of response errors (e) made by a sample of subjects is divided by the total number of all responses they make (nk , where n is the number of subjects and k is the number of items). This ratio is subtracted from unity—(1) to yield the coefficient reproducibility, R : ($R=1-e/nk$). The value of R may be used as a measure of the degree to which the set of items is scalable, that is, it represents a unidimensional attribute. An arbitrary value of .90 is sometimes taken as the minimum acceptable Coefficient of reproducibility. Generally the reproducibility or scalability of a set of items can be increased by eliminating certain items which account for a disproportionate number of errors.

The procedure involved in constructing a *scalogram* is briefly as follows: First it involves the selection of a small number of

statements from a large number of possible statements representing a universe of a content, which, by and large, should have the most homogeneous content. For each statement, weights of 0 and 1 are assigned for two response categories of agree and disagree. Usually Guttman's techniques can be best illustrated for two response categories though there are methods to apply this technique for more than two response categories. These weights are so assigned that one is always given to the response category that indicates more of whatever it is that is being measured in terms of favourable attitude getting 1 and unfavourable attitude getting 0. These statements are given as a sample to hundreds of persons. They are asked to respond to these statements in terms of agree and disagree. A score is obtained for each individual by summing the weights assigned to the response categories he has selected. The total score of each subject is arranged in rank order from high to low.

From this point, there are several procedures to evaluate the scalability of the set of items. There are techniques like the Cornell technique and techniques suggested by Goodenough W.H. etc. A simple method to find out the coefficient of reproducibility is based on the total frequency of the responses for each statement. The predictive patterns of response for each of the statements for a set of say, four statements with a total score of 4 or 0 can be easily assumed. The predictive patterns of response for the remaining total scores of 3, 2 and 1 for a set of statements can be worked out as follows: The distribution of total frequencies for each of the statements is examined and the lowest frequency is given 0 and the remaining statements 1 each which gives the predictive response for a total score of 3. Similarly, among the remaining total frequencies, the lowest is given 0, and the next two, 1 each which gives the predictive response for a total score of 2. Thus, the predictive response pattern is found for a total score of 1 also using the same procedure. On the basis of this, the predictive pattern of response for each total score is obtained and the response errors are calculated for each subject to arrive at the coefficient of reproducibility.

Though cumulative scales like summative scales are composed of monotone items, the additional property of item magnitude is taken into account by the scoring procedure. Clearly this procedure is cumbersome, arbitrary and difficult to specify analytically. There are other reasons besides analytical complexity for rejecting cumulative scaling procedure. Whether items are retained or discarded depends more on variations in item popularities than on degree of inter-correlation or functional equivalence. The ideal modal of scalogram analysis assumes unidimensional items which probably do not exist. The kind of items retained are typically those which are widely spread in popularity. Generally, cumulative scales are not recommended for attitude measurement.

Rating Scales

There are a number of rating scales differing in the fineness of the distinctions they permit and the procedures involved in assigning persons or objects to positions. One common feature to all types of rating scales is that the rater places the person or object being rated at some point along a cotinuum or in one of an ordered series of categories. Some of the ratings scales are, graphic rating scale, itemized rating scales, comparative rating scales and self-rating scales.

In *Graphic rating scale*, the rater indicates his rating by simply placing a check at the appropriate point on a line that runs from one extreme of the attribute to the other. The scale points with brief descriptions may be indicated along the line; their function is to serve as a guide to the rater in localizing his rating. This scale is relatively easy to use though certain precautions like avoiding the use of end statements that are extreme, and making the descriptive statements as close as possible to the numerical scale. In *itemized type* of scale like the graphic scale, the rater selects one of the limited number of categories (usually five or seven categories) that are ordered in terms of their scale position. The scale also provides a central neutral point with equal number of categories on either side. This scale consists of a series of items describing a particular act or attribute of the object or person to be rated and the rater selects one which best describes the act or the attribute of an object or person. One could obtain reliable ratings if the categories are properly defined. In *comparative rating scale*, unlike the other two scales, the rater gives relative ratings. The positions on the rating scale are expressly defined in terms of a given population or social group or in terms of people of known characteristics. For example, the rater may be asked to indicate whether the ratee's sociability more closely resembles that of person A, B or C all of whom are known to the rater. Another comparative rating scale is the rank-order scale. Here the rater ranks each one of the individuals in relation to one another on the characteristic being measured. Ranking is used in this way only when the rater is confronted with a limited number of ratees. There is another technique known as *forced choice technique* where pairs of items are chosen which have equal popularity but different discriminating power. Two such pairs are combined in a tetrad. The rater is required to say which item in the tetrad is most like the individual and which is least like the individual. The major difficulty in this technique is that the four items in the tetrad may not be comparable. However, this is an attempt to overcome the 'halo effect'. It is well-known that some sets of specific items are not much better than an overall rating scale since all items can be rated on the basis of a general impression of the individual.

In most of the investigations for want of raters who are familiar with the ratees and also where information on some non-observable

behaviour is required, *self rating technique* is used where the individual himself gives ratings on the attribute measured. It has its advantages and limitations like those of self-reporting techniques. Sometimes, the individual may be unaware of the presence of an attribute being measured in himself or where aware, may be unwilling to reveal its presence and also one's conception of moderate or extreme position in the measured attribute varies from one another making the rating difficult. However, this method has proved useful in the measurement of social attitudes as the individual rater is in a better position to report his beliefs, feelings etc.

There are certain disadvantages in the use of rating scales. There is room for systematic errors in one's rating through the influence of personal bias of the rater or raters which is commonly referred to as 'halo effect'. In this, if more than one characteristic of a person is to be rated, raters frequently carry over a generalized impression of the person from one rating to another. Another frequent type of constant error is the "generosity error" where the rater develops a tendency to over-estimate the desirable qualities of the ratee whom he likes. There is another type of error known as contrast error where there is a tendency on the part of the rater to see others as opposite to himself on a trait.

One of the ways of reducing constant error is to train the raters carefully and make them aware of the possibility of such biases in rating. The generosity error may be reduced by using relatively neutral descriptive terms for the scale positions rather than evaluative ones. Halo effect may be reduced, or eliminated altogether by having various ratings of a given person made independently by different raters or by the same rater at different times without awareness that he is rating the same person. Some random errors may also affect ratings because of different frames of reference of the raters in describing individuals in terms of the characteristics in question. Reliability of the rating scale can be increased by not only careful training of raters but also by giving attention to the construction of the rating scale. Some of the factors that must be taken into account in constructing a scale are, 1. The discriminative ability of the judges or the raters including the extent to which they are trained and experienced, 2. The kind of characteristics to be judged, 3. The conditions under which the ratings are to be made—whether it is based on extensive or limited data. The reliability of ratings is usually enhanced considerably by having several raters making independent ratings, comparing their ratings and discussing discrepancies and making second independent ratings that are then pooled or averaged to give a final score. Validity of the rating scale can also be assumed to be present if the attributes being measured were relatively "objective" so that their meaning would be uniformly understood by the raters using the scales, and the ratings were themselves obtained under optimal conditions, including carefully constructed scales, trained judges, and specified common frames of reference.

An attempt was made in this paper to briefly sketch some of the major scaling methods for attitude measurement which are in use. Each one of the methods has its own advantages—refinement of the procedure, scoring and analytical nature but each of them has its own disadvantages in terms of time consumed, feasibility for certain measurements and complexity involved through cumbersome scaling procedure. The use of any particular technique very much depends on the nature of research and the type of data that individual researcher would seek to examine. As pointed out in the beginning it is a question of whether the interest is in the response or in the individual, which by and large decides the approach to be followed and the scaling methods to be used. This paper only gives an outline in a descriptive way but those interested in further information and the techniques of the scale are advised to look into other references suggested.

Processing of Data

M. Satyanarayana Rao

R. Yadagiri

In any research assignment or a project collection of data is followed by processing and analysis which is a difficult task. Processing and analysis of data involves a number of closely related operations with a view to draw answers to the research questions.

Processing of data refers to consolidation, recasting or regrouping of data so that the job of analysis is made very easy. Analysis of data refers to seeing the data in the light of hypotheses or research questions and the prevailing theories and drawing conclusions that are as amenable to theory formulation as possible. Data processing depends to a large extent on the nature of data. It may be qualitative or quantitative in form. If the data is verbal in form it may have to be changed into numerical form for better understanding. The most important factor to be considered in processing the data is the co-relation of the nature of the data and the techniques of data processing. For instance if one intends to make a comparative study of two political institutions in the individual times, it may be futile to attempt to quantify large quantities of verbal data. Basing on the objectives of the study and on the aspects of the data, certain categories can be formed in order to draw a systematic and comparative analysis. If the research is concerned with the factors of serial behaviour of the contemporary time wherein survey research techniques are employed quantification of verbal data is essential.

Many researchers think of data processing only after the completion of data collection and are often confronted with many unexpected problems resulting in inordinate delay in the completion of research work. These problems can be avoided if a careful plan for data processing is prepared as an integral part of the research design. The plan may be based on the type and number of variables to be studied, complexity of hypothesis or hypotheses, the number of respondents and the extent of data to be collected. If the data proposed to be collected is very limited and simple data processing may be done entirely by hand. If the data to be collected is large and complex, the assistance of trained staff like coders and machines like computer may be necessary. It is better to identify coders

and book computer time well in advance. Estimate of financial resources is equally important. All these aspects may appear to be very simple but in the absence of a well designed plan for processing data, these simple matters may turn to be complicated riddles.

Stages in Data processing: Data processing is mainly discussed here in relation to the data collected by survey research through interviews with the help of structured questionnaires. In processing this type of data there are three important stages viz., (a) editing, (b) coding, and (c) tabulation.

Editing refers to the checking of questionnaires for completeness and accuracy. This avoids possible errors which may distort the subsequent stages of processing of data. Coding means transforming of voluminous data in the questionnaires to numerical form into the code sheets. Tabulation implies comparative study of different variables by means of statistical techniques like regression, factor analysis and multivariate analysis. Tabulation may be done by hand or machine depending upon the quantum and complexity of data to be tabulated. Detailed description of these three stages of data processing is necessary to understand the skills involved in it.

Editing

Editing the completed questionnaire or schedules is the first and the important stage in the data processing. In spite of the expert knowledge and experience of the interviewers, certain errors are bound to be there in the questionnaires. Questionnaires may have certain gaps or may consist of some glaring inconsistencies. Data may be illegible or may lack uniformity. Careful editing of schedules, therefore, is essential to rectify all such possible errors.

The initial editing of questionnaires begins in the field itself. Interviewers are expected to thoroughly check questionnaires immediately after their administering, if possible on the same day. Sometimes an interviewer may forget to ask a question or may forget to record a response. In either case interviewer can re-interview the respondent. If the information which is missing can be inferred from the response given by the same respondent to some other question, the same can be written to fill up the missing data. Re-interviewing rather than leaving the other blank. As a precaution, a note can be made for all the responses obtained by re-interviewing to identify possible inconsistencies in editing.

In spite of the extreme care taken by the interviewers, the scope for errors in interview schedules cannot be ruled out. After the receipt of all questionnaires at the headquarters, it is essential to thoroughly check them to avoid errors. If one reposes great confidence in the interviewer's ability and skills and feels that the scope for errors is very minimal, complete checking of all questionnaires may be avoided. Even then a sample (30%) of interview schedules should be checked and if this confirms the absence of errors one can proceed to the next stage of data processing, i.e., coding.

The scrutiny of interview schedules centres round three main aspects viz., completeness, consistency and regularity.

Completeness: The first character to be checked in questionnaires is whether all the relevant data is recorded. In other words it is to find whether all questions in the questionnaires have been answered or not. Certain blanks are bound to be there in the interview schedules. Some respondents might have possibly refused to answer certain questions. For example, a respondent, out of fear, may not like to reveal the information as to whom he voted for. Sometimes interviewers in their eagerness to complete the questionnaire quickly may forget to ask a question or may forget to record an answer. If proper care is taken, such mistakes can be minimised at the initial editing in the field itself. At the editing stage in the headquarters proper care should be taken to fill the gaps for the missing data. Going back to the field to collect the missing data is costly and time consuming. If the information that is missing is factual and if it is avoidable it can be filled up later. For example, if an interviewer forgets to tick the sex category of the respondent, it could easily be known by the name of the respondent. If the question unanswered is an open ended question nothing can be done except approaching the respondent again. Missing answers may be obtained from a literate respondent by postal correspondence which will work out to be less expensive. An illiterate respondent has to be approached by the interviewer personally to obtain the missing data.

Blanks also may be found in questionnaires when the questions are not applicable to the respondents. This can easily be known by looking at the answers to other questions in the same questionnaire. A question may be unanswered due to the omission of the interviewer or it may be due to the refusal of the respondent to answer it. It is extremely difficult to discern the reasons at the editing stage. To avoid such confusion interviewers should make a proper note of the questions to which answers are refused.

Careful scrutiny of answers to open ended questions is also necessary. The common problem here is the legibility of the answers recorded. Interviewers may be in a hurry to complete questionnaires or may be impatient and write the answers in illegible form. Interviewers may also scribble answers in order to cover up their grammatical or spelling mistakes. Interviewers are to be called to read out such answers. They may be in a position to make out the meaning from what they have written. It is also likely that they may not be in a position to make out anything from what they have written if the time lapse between actual interview and editing is very long. In such cases the only alternative is re-interviewing.

Inconsistency: Inconsistency in responses to questions is another important feature. Sometimes answers given by a respondent may be inconsistent and sometimes errors may be committed by the interviewers. These mistakes can be known by careful examination of the questionnaires. Illiterate respondents may give inconsistent

answers. In such cases no efforts should be made to change the form of answer.

Regularity: Regularity mainly refers to the methods of asking questions by the interviewers and methods of recording answers. Irregularity results in lack of objectivity in the analysis. Regularity in the mode of asking questions is a very important aspect as the regularity of the responses depends upon it. Difference or bias in the method of asking questions can be known by carefully examining the answers.

For example:

1. People have different opinions about smoking. Some think it is good and some think it is bad. May I know what is your opinion?
2. Don't you think that smoking is bad?

The first question is the correct form of question and it should be asked the same way to get genuine response. If the interviewer changes the form of the first question to the form of the second question while asking, the responses obtained may be biased. Whenever such doubt arises while looking into the questionnaires, a careful examination of the interview schedules completed by the interviewer would reveal the error. Major errors can be minimised by giving proper training and instructions to the interviewers.

Regularity in the data also refers to factual information. In rural surveys interviewers sometimes face the problem of uniformly recording answers to a few factual questions. Even after putting their best efforts errors may have taken place and it may lead to irregularity in response. For example, take the question seeking the income of the respondent. In the rural area illiterate respondents give the information in terms of the quantity of crop they get or in terms of the quantity of wages they get in kind for a day, month or year. Often uniformity is lacking in the units of measurement to which respondents refer. Interviewers have to do the tough job of mathematical calculation to find out the monthly or annual income of the respondents as the case may be. It is better if interviewers record the exact answers given by the respondents and do the calculations leisurely at the headquarters. Thus, with certain precautions regularity can be maintained in recording the responses and any irregularity can be discerned by editing the interview schedules.

Coding

The next major task to be undertaken in data processing after editing is coding or converting the qualitative data in the questionnaires to numerical form and presenting it on the coding matrix. This process reduces the huge quantity of data to manageable proportion and makes it feasible to further process the data more systematically and rapidly.

In most surveys, certainly whenever results are to be put in quantitative form, the intermediate stage is the coding of the answers. Sometimes this and the initial editing are joined in a single operation.

The purpose of coding is to classify the answers to a question into meaningful categories, so as to try out their essential pattern.

The process involves two distinct steps. The first is to decide on the categories to be used, the second to allocate individual answers to them. The set of categories to be used will be referred to as the coding frame. The set of coding frames covering all the information to be abstracted from the questionnaires is commonly known as the code book.

The Coding Frame: A coding frame relates to a single question. In cases where there are only a few possible answers to the question the preparation of the frame raises no problems. The question: 'Have you smoked any cigarettes today?' admits only of the answers 'Yes' and 'No' together with 'Don't remember', 'Refuse to answer', 'Not applicable', so that the frame decides itself. Where the frame does not determine itself automatically, it is a matter of deciding how detailed a grouping to allow for in the coding, which in turn depends on how the answers are expected to be distributed and what analysis is being planned.

For example:

If (respondent lived) in a house.

What kind of house is it ?

Whole thatched house	5
Whole semi-thatched house	6
Whole terrace house	7
Whole Self-contained flat	8
Other (give details)	9
Not applicable	Y

It is assumed that these represent the main alternative answers and that it will be useful to keep them distinct. Codes 5, 6 & 7 might have been combined to constitute a 'whole house' code, but the difference between the three types here is of interest. One cannot lay down any hard-and-fast rule for this kind of decision. By and large, it is advisable to retain more rather than less details in coding since it is easier to amalgamate groups in later analyses (particularly if a computer is used) than to split one group into several when they have been coded alike. On the other hand, a very detailed coding is extravagant as regards punched cards or other computer input media and makes the analysis unwieldy and at the same time increases the difficulty of allocating answers

accurately. The whole point of coding is to summarise the data, and it is as unhelpful to retain too many categories as it is misleading to use too few.

Establishing a coding frame is, however, not generally as easy a task as the remarks so far suggest. Some coding frames will relate not to single questions but to a combination of questions or even the whole questionnaire. These frames, which are useful for tapping areas on which information is provided by the respondents' answers to some of the open questions on the questionnaire, can be very difficult to construct. But then one need think only of the general run of open questions to realize how hard it may be to set up, ahead of the actual interviews, a list of categories which will be exhaustive, mutually exclusive and suitable for the purposes of the survey.

A representative sample of completed schedules is examined and the answers are noted. Gradually a pattern emerges and on this the final coding frame is based. Groups containing very few cases can be combined into a 'miscellaneous' category—care being taken not to lose anything which may be of substantive interest later on. Construction of the coding frame is not a task to be delegated to routine clerks; it has to be done by somebody fully in touch with the purposes of the survey and of the way the results are to be used. Before a frame is finalized, every opportunity should be given to coders to test it further on samples of replies, so as to examine their coding differences and eliminate ambiguous or troublesome codes. This not only results in a better frame but also serves as good training for the coders. If proper care is not taken at this preparatory stage, the final coding will be repeatedly held up because answers do not fit properly in any code or, could reasonably be assigned to more than one category. In such a case the more doubtful decisions have to be taken and this results in greater variability between coders.

In discussing the general principles of constructing coding frames no reference has yet been made to the mode of analysis to be employed, but this also dictates certain characteristics in the form of the coding frame. If the analysis is to be conducted on unit record equipment, the coded data must first be transferred to punched cards. With computer analysis, punched cards are usually—but not always—the primary means of input for survey data. Thus the features of a punched card have an influence on the nature of a coding frame.

An ordinary punched card has 80 columns, and each column has ten marked punching positions, 0, 1, 2, ..., 9 and two more unmarked positions above the 0. These two positions are variously unknown as X, Y, X, V; 10, 11; +L, U; etc. To record a code in a particular column, a hole is punched in that column of the card in the code position required. The principle involved in using punched cards to record survey data is illustrated below.

Let us take a question that has six possible answers, represented by codes 1-6. In the layout of the card, one column, say column 15, is allocated to this question and each card (representing one respondent) is punched on column 15 according to the code ringed. Similarly, two or more columns can be used to punch codes which cannot be condensed to one column. For example, if exact age were to be coded in, say, columns 6 and 7, column 6 would contain the tens and column 7 of the units so that a respondent aged 35 would have a 3 punched in column 6 and a 5 in column 7 for his card. On the other hand, if ages were grouped into bracket codes they could be recorded on a single column; e.g., under 20 years code 1, 20-29 years code 2, 30-39 years code 3, ... 80 years and over code 8.

A point to remember when designing the card layout is that some of the columns, usually at the beginning of the card, have to be reserved for an identification code, so that the questionnaire to which the card relates can be determined. If there are, say, 2,500 questionnaires, the first four columns could be used for an identification number, numbering the questionnaires from 0001 to 2500. If all the information on the questionnaire cannot be recorded on one card, more than one can be used; each card must then contain its questionnaire's identification number and, in addition, another column—the same one for all cards—has to be used to distinguish between the several cards relating to the one questionnaire.

Other than the columns needed for identification purposes, the rest of the card is free for use to record the questionnaire responses.

Unless the analyses are to be confined to cross-tabulations it is safer to restrict the codes to the positions 0-9. This 0-9 coding also has the advantage that it can be used with other computer input media (e.g. paper or magnetic tape) as well as punched cards.

The intention of the preceding remarks has been to indicate that the coding frames to be employed should not be designed without reference to the means of analysis. Early advice on the suitability of the proposed coding frames for the mode of analysis to be used can help one to avoid time-consuming and expensive problems later on.

Coding the Answers: The actual allocation of responses to individual categories can be done by the respondent—as with questions offering a specific choice of answer, by the interviewer—as with questions answered freely but coded in the field; or by the office code. The first two cases involve pre-coded questions and all that the interviewer (or, in a mail questionnaire, the respondent) has to do is to ring, tick or underline the appropriate code or codes.

The third type of coding is used where an open question has been asked and the answer recorded as nearly verbatim as possible. It has now to be coded in the office. The coder may be required simply to note whether the answer contains a reference to a particular

item. (i.e., to the cost of living in general) or he may have to allocate the answer to one of several categories, according to the strength of the reference or according to the various points made. Sometimes the coding is based on the answer to only one question; at others, the coder may have to look at the answers to several questions before coding a particular answer. Coding instructions should be specific on such points.

Another issue to be decided is whether the codes are to be recorded on the questionnaire or whether a transfer sheet is to be used. If a large proportion of the questions is precoded the use of a transfer sheet means that the coders spend much of their time wastefully copying codes into transfer sheets, and may of course make a few errors in doing so. In such cases it may be preferable to record the coding of open questions on the questionnaire, having printed on it ready for use either a set of code numbers or more commonly an empty box in which the code number is to be written. The disadvantage of this method is that the punch operator then has to punch the cards straight from the questionnaires, and this is a more difficult task, and hence more prone to error, than punching from well-designed transfer sheets. In addition, the design of the questionnaire is more complex for, besides all the other points to be borne in mind in its construction, its layout must be made to fit the needs of the punch operator. If the questionnaire is a complex one involving many open questions, it is better to use transfer sheets.

It is clear that the quality of the coding will depend on how well the initial editing has been done, on the soundness of the coding frames and on the skill and care of the coders. Careful training of the coders, including some trial coding of interviews picked out for their variety of responses, can help the coders to become perfect in their job. A detailed check on the coding of the first batch of the questionnaires can detect mistakes made by coders and can act as a further form of training. In addition check-coding of a sample of questionnaire throughout the coding operation measures the reliability of the coding, provides a means of assessing individual coders, and acts as an incentive to the coders to maintain their concentration. With particularly difficult coding frames it may be advisable to leave the coding to one or two coders who receive specialized training in the subject matter, for example, this might well apply to social class coding.

However, despite all the care taken in the construction of the code book and training of coders, problems may arise in the final coding. Coders will probably require clarification of some of the codes, and extra codes may even have to be added to the coding frames. In such case, great care is needed to ensure that all coders are made aware of, and fully understand, the changes/corrections are to be carried out in questionnaires that are already processed. Changing codes during processing is error prone, and should not be

undertaken unless essential. The researcher himself is the only person who can sensibly make a decision on whether it is essential, and decide how to deal with such problems, and he therefore needs to keep in close touch with the coding process. Otherwise the coders who will be forced to use their own discretion, may make wrong decisions, and may take different decisions, violating the principle of uniformity.

Code book is the record of all details of the quantification scheme, it clearly specifies the way in which each and every item of information in the questionnaire is classified and coded. In fact, a tentative code book can be prepared after the formulation of the questionnaire containing all information about pre-coded questions. However, a finalized code book can evolve only after the data collection and its categorisation.

Code sheet is a document on which all the information in the questionnaires is consolidated in the numerical form by using the shorthand notation of the coding system. The large quantity of data in the questionnaires is converged to the manageable proportions in the code sheet. It serves as a convenient data storage device for easy reference. With the help of the finalized code book and recorded questionnaires all the information in the questionnaires can be transformed to the code sheet.

Printed code sheets, containing 80 columns and 30 rows are available and particularly they are very useful if one intends to make use of computer in processing the data as they are similar to IBM cards.

Normally, each respondent's information is recorded in one questionnaire. If the number of variables is not many, it might be possible to place all the information about a single questionnaire in one single horizontal row in the coding sheet. Depending on the number of digits for variables in question, columns in the coding sheets are specified for them. A single digit variable with codes 0-9 will have one column. In a double digit variable with codes 00-99 will have two columns. If 80 columns in the coding sheet are not sufficient to record all the information in the questionnaire, the supplementary code sheets can be used and in that case, the sheets could be numbered as card 1, card 2, card 3 etc., or Deck 1, Deck 2, Deck 3 etc., for identification. There would be as many columns as coded variables and as many rows as respondents. After recording all the data on the code sheets a thorough cross verification should be made and the errors should be rectified. For the convenience of easy manipulation of the data from the codes, sheets have to be further sub-grouped into unit record.

The unit of analysis is an individual. Since, all the information about the unit is recorded in one questionnaire, the questionnaire is the unit of record. The horizontal rows in the coding sheet give information about each of the units. Hence, the information in each row is to be transferred to separate sheets of small size (3"×5"). If machine or computer is used, there could be IBM

cards. This would facilitate the rearrangement of the data in any order and working out different tables.

Tabulation

In the majority of surveys, the data, once edited and coded, are put together in some kind of tables and may also undergo some other forms of statistical analysis. There is nothing statistically sophisticated about tabulation. It amounts to no more, basically, than a counting of the number of cases falling into each of several classes. The editing and coding have sought to ensure that the information on the individual schedule is accurate and categorized in suitable form. It now remains to add all the schedules together to count how many of them have answer (X) for question A and how many answer (Y).

The process can be done manually. Hand tabulation is exceedingly simple, involving no technical knowledge or skill, and it need not, even for cross-analysis, be particularly laborious. If one wants an analysis showing the distribution of income by occupation, all that is required is a table skeleton showing one of the variables horizontally and the other vertically; tally marks are made in this as one goes through the schedules. If a number of tables have to be constructed, it may be inconvenient to go through the schedules afresh each time, and an alternative is to first transfer the relevant schedule data on to sheets from which counts can more easily be made.

Although tabulation can in principle be used in any survey, in practice, because of its tedious nature, slowness, and liability to error, it is mainly restricted to simple situations. If the number of survey cases is small, say of the order of 100-200 or less, there may be little point in tabulating by machine since this necessitates putting the data on to punched cards and a certain amount of extra trouble. For small surveys most of the tables to be constructed will be simple ones, involving only one or two variables at a time, and then hand tabulation is quick and straightforward. But for survey analyses requiring complicated cross-tabulations, involving more than two variables, or even requiring just a large number of two-way tabulations hand tabulation will be slow and unwieldy.

The flexibility is one of the greatest advantages in machine tabulation. Once the data have been put on punched cards the construction of tables is speedy and straightforward. When one is not certain what tabulations are going to be wanted, machine tabulation is preferable, for the loss of time and work is not too great if some of them are not used. On the other hand, there is one disadvantage in machine tabulation. It is all too tempting to run any number of tabulations, worrying little as to whether they will really be needed. This the 'let us run off the tables and see what we can get out of them' attitude is reasonable up to a point, but a

waste of resources if it gets out of hand. Many a research worker would have to admit to the possession of tables which have barely been looked at. However carefully the tabulation plans have been worked out, the analyst is bound to think of new analyses as he goes along. He may have done tabulations of, say, the answers to the question 'Do you smoke?' by the respondents' income and the respondents' sex, but not according to their sex and income, i.e., a three way tabulation. With the answers on punched cards the latter table is easily prepared, and at low extra cost. With hand tabulation, such 'afterthoughts' can take a good deal of time.

A very practical, but nevertheless important, factor in deciding between hand and machine tabulation is whether there is unit record equipment or a computer with programmes for tabulation readily available. If there is facility with easy access, the terms of use are also important. While machine analysis is generally quicker than hand tabulation it can be expensive, and for fairly small survey it could easily take up a substantial proportion of the total budget. Hand tabulation can be done directly under the researcher's eye, if he does not indeed do it himself. This has a certain advantage, it brings to his notice the peculiarities of individual cases. Machine analysis more often than not involves giving instructions to an operator; it certainly requires expert advice. And one early piece of advice to be obtained is a fairly good estimate of the likely cost of the required set of tabulations.

For any survey which involves large number or for which many cross-tabulations are required, machine analysis is almost invariably the right way to proceed. For a survey organisation equipped with a computer or unit record equipment, the question of hand versus machine tabulation hardly arises. But with small *ad hoc* social research surveys, the choice is often a real one, and some of the factors on which it should be based have been outlined above.

Punching the cards

A basic system for inputting data is the use of an intermediate coding procedure on a special computer media. There is now a considerable range of input devices which use a specially coded input media, the most important being: 1. Punched Cards, 2. Paper tape, 3. Magnetic tape, 4. Magnetic disk, 5. Magnetic drum, 6. Console typewriter etc. But punched cards have been used as means of input from the earliest days of computers. A punched card is a piece of high quality card stock of uniform length, width and thickness. The card comprises a number of vertical columns and horizontal punching positions. Data is recorded in the card by punching holes in it, a character being represented by a pattern of holes in the column.

A key punch operator punches the cards on a card punching machine and it works like a typewriter. Punched data can be

checked by means of a check reading station, thus, going a 'read-after-punch' check by comparison. Punching is a routine task which can be performed at a high speed and with considerable accuracy by skilled punch operators. To maintain speed and avoid errors, however, the operator should be in a position to read off the code to be punched for each column without having to search for it in the body of the questionnaire or to check its accuracy. If the code typed on the verifier agrees with the hole already punched, the punch is accepted; if not, a light comes on and the machine gets locked. The verifier operator then decided if it is a mistake must be repunched. To show that a card has been verified, the verifier makes a mark on it. Verification will not eliminate all errors for it is, of course, possible for both operators to punch the same erroneous code, but the chances of this happening are generally slight. It can, however, easily occur when the codes are not written clearly and both operators interpret a code in the same (wrong) way. Careful handwriting in coding is therefore important.

Unit record equipment

If it has been decided to analyse the survey data by machine there is the choice between using an electronic computer and using unit record equipment. If a computer is available there are great advantages in its use and as a result, in the last decade computers have to a considerable extent replaced the earlier equipment for survey analysis. Although computers are nowadays widely available, not every researcher has access to one. Some researchers may still use unit record equipment, and for that reason we will give a brief description of some of the more important features of these machines.

Once punched and verified, the cards can go on the unit record machines, and what is done then depends on the analysis required. A good deal can be achieved on the *Sorter*, a machine which 'looks' at one column at a time and distributes the cards into stacks according to the hole punched in that column. A counter-sorter at the same time counts the cards falling into each answer group and shows the total in the counter above it. Such a machine can do most of the tabulations required in censuses and surveys and is reasonably convenient even for the many cross-tabulations that are generally required.

With any sizeable punched-card installation there will also be some kind of tabulator. These machines can add the numbers punched in a given column for set of columns on all the cards, arrive at any totals required and print both the numbers and totals. They can also be used to carry out complicated cross-tabulations. The use of the tabulator requires specialist skills or, at any rate, familiarity with the machines. Given this, the operator can carry out on the machines all the tabulations required in social surveys and some of the statistical calculations as well. Sorter and tabulator

are thus the basis of any punched card installation; other more specialized machines, such as the reproducing punch, interpreter, collator and multiplier, are valuable for special tasks. An extremely useful machine, an electronic statistical machine, is able to combine the functions of many of the machines already mentioned; specialist skill is needed for its operation. Its flexibility makes it a valuable tool for survey analysis—it can for example efficiently carry out a cross-tabulation and print the results, and so can take the place of both sorter and tabulator.

The development of electronic computers has led to tremendous advances in survey analysis. Not only has it resulted in great ease in tabulation but, more importantly, it has statistical procedures. Before the advent of computers the enormous amount of computation required for multivariate statistical analysis in large-scale surveys limited the use of these methods drastically. Multivariate methods were employed by only a few survey researchers, and even they had to restrict the extent of their analysis severely. Few remarks on the uses of computer for survey analysis: at the outset it should be made clear that, in order to use a computer for routine analysis, the researcher does not in fact need to know a great deal about the computer. Most computer installations have large libraries of computer programmes. For this purpose he does not need to know about computer languages, such as FORTRAN, ALGOL and COBOL, or how to write programmes. All the information he requires should be clearly given in the documentation of the programmes he plans to use. Of course, if he wants to conduct an analysis for which no programme has been written for his computer, one will have to be developed, and this will require the skills of a computer programmer. Sometimes a programme written for another computer can be adapted for the machine to be used by the researcher.

In conclusion, we should mention that punched cards are not the only input media for computers, though for survey analysis they are the most common form of primary inputs. Paper tape is an alternative form of primary input but is rather unsuitable for survey work. The big advantage with punched cards is the relatively slow speed with which they can be read into the computer. There are therefore often considerable savings to be had from transferring the data on the first computer run from the punched cards to a different form of data storage, generally either in magnetic tape or disc. Survey analysis typically develops in stages, with early results suggesting later analyses, so that usually a number of computer runs are needed before the work is completed. If all the runs after the first use tape or disc input, both of which can be read into the computer very much faster than cards, substantial savings in time and hence cost will accrue.

Analysis of Data

T. Tirupathi Rao

F.D. Vakil

Analysis of the data is the most skilled task of all the stages of the research. It is a task calling for the researcher's own judgment and skill. It should be done by researcher himself and should not be entrusted to any other person. Proper analysis requires a familiarity with the background of the survey and with all its stages. The analysis does not necessarily be statistical one. Both quantitative and non-quantitative methods can be used. The aim of analysis, e.g., if it is in regard to election study is (1) to characterize what is typical in a voters group, (2) to indicate how widely individuals in the group vary, (3) to show other aspects of how the individuals are distributed with respect to the variable being measured, (4) to show the relation of the variables in the data to one another, and (5) to describe the difference between two or more groups (of voters).

The steps envisaged in the analysis of data vary depending on the type of study. If there exists a set of clearly formulated hypotheses to start the study with, then each hypothesis can be seen as a work prescribing a certain action to be taken vis-a-vis the data. The more specific the hypothesis, the more specific the action. In such a study, the analysis is almost completely a mechanical procedure. The task of analysis is reduced to just getting the appropriate combinations of data and reading them off against the instructions for verification and falsification of hypotheses. This however is a very rare possibility in social science research.

Part of analysis is a matter of working out statistical distribution, constructing of diagrams, and calculating simple measures like averages, measures of dispersion, percentages, correlation etc. Thus statistical analysis form part of survey analysis. The case of complicated statistical techniques in surveys often stems up from the desire to establish and interpret multivariate relationships. The analysis means verification of hypothesis. Under ideal conditions of precision and simplicity, analysis presents very few problems since the statement of the hypothesis and the elaboration of the experimental design will automatically provide for the analysis of the data.

The problems raised by the analysis of data are directly related to the complexity of the hypothesis or hypotheses.

There are two aspects of scientific research, however, which make the occurrence of so ideal a situation relatively infrequent. The first of these is the appearance of an anomalous empirical regularity or the absence of an expected regularity. Such instances require analysis not anticipated by the original design. Similar to this is the use of data, gathered for one purpose, for quite another problem. Both these represent what is called secondary analyses. From a very "pure" experimental point of view, such analyses are considered to yield answers which are "plausible" but not capable of being stated in the customary "probability" terms of science.

However, secondary analysis is not only common but necessary and it is certainly of great value, even if produces no more than plausible statements to serve as hypotheses for subsequent verification in more stringent terms.

Problems of data analysis involve all the questions raised in research design, for secondary analyses to involve the designing and redesigning of substitutes for the controlled experiment. This indicates that there are two types of questions about analysis which may be raised. One of them relates to the techniques of representing the data and the other to the methods of logically ordering them so that questions can be raised and answered.

Statistical Representation

The simplest form of representing research findings is the frequency distribution or tabulation. The essential element in tabulation is the summarization of results in the form of statistical tables. All that is meant by this is the presentation in one column of different qualities of an attribute, or different values of a variable, together with entries in another column showing the frequency of the occurrence of each of that classes. The only problems connected with the preparation of a useful frequency distribution or simple table is to use common sense with respect to three things.

First, the units entered in the left-hand column describing the qualities or values must be mutually exclusive, as well as inclusive of the vast majority of observations which will be made. Overlapping values or attributes can lead to confusion.

Second, the tabulation must have internal logic and order. However when tabulating qualities where the order may not be so obvious the need for a logical treatment is equally great. Not all tabulation will have a logical structure but in most cases, it is possible to find an order to use as an analytical principle even in simple tabulation.

Third, when the left hand column of a tabulation is a quantitative variable, the class intervals must be carefully and reasonably chosen. Depending on the nature of the data and the number of cases studied the class intervals should be evolved. For a proper

understanding of the data the individual items are arranged in either ascending order or descending order of magnitude.

Efforts should be made to have intervals of uniform size. The intervals should not be so small as to lose the advantages of summarization or so large as to conceal the more important characteristics of the distribution. Moreover, if the class-intervals are too small, vacant or blank intervals might occur. If comparisons are to be made between similar data, it is advisable to select class-intervals of the same size for the distributions.

After the size of the class-intervals has been determined, it is important that they be clearly designated in the frequency table. Each interval must have definite lower and upper limits and must be expressed in such a way as to obviate any possibility of misinterpretation or confusion.

There are two general ways of stating a frequency distribution in simple ways. These are used singly and together, depending upon the problem at hand. One of them is to compute a value which represents the central tendency of the distributions. Such measures are called averages and include among others the mean, the median and the mode.

The other general type of summary of a frequency distribution includes measures of dispersion such as the standard deviation and the coefficient of variation. These measures are used to compare the relative wideness of spread in any two or more frequency distributions.

A common and simple method of comparing frequencies is the use of the ratio. A ratio is merely an indicator of actual quotient which relates the size of one number to another. Their main utility is to act as a relative measure and thus permit the comparison of otherwise unequal numbers. A related method of comparing values is the proportion. This measure is a fraction such that the numerator is one of the two observed frequencies and the denominator the sum of observed frequencies. The purpose of using percentages, ratios and proportions is to simplify the problem of comparison. They can serve to put qualitative characteristics into numerical form. Percentages reduce two frequency distributions to a common base thus making comparisons simpler. Percentages are of great aid to communication through simplification but they are also susceptible to misuse by obscuring significant facts. This underlines the importance of presenting a table of percentages with the actual numbers which they represent. This not only guards against the kind of misinterpretation but also assures the reader that there is an adequate base for the calculation of a percentage. When a simple frequency distribution is turned into percentages it is usually for the purpose of making clear the comparisons between the several class intervals. In this case there is seldom a problem as to what the base of the percentages should be. One case however in which a

difficulty may arise is where the tabulation includes residual categories or more than one dimension. It is very important that the base of a percentage be fully and carefully described to avoid confusion.

The more common problem arises when a cross tabulation is used; even though the categories are complete it is still necessary to make a choice as to whether the percentages should be computed horizontally or vertically. It is advisable that the percentages should be computed in the direction of the causal factor. This does not mean that one of the factors must be the actual cause of the other but in the mind of analyst one of them is merely thought of as influencing the other. The general principle is to compute in the direction of the factor which the analyst wishes to emphasise. But even then the analyst's concept of desire for emphasis is not always the only determiner of the direction in which percentages should be calculated. It is said that the percentages should be run only in the direction in which a sample is represented.

The cross tabulation of two or more attributes or variables is merely a formal and economical method of arranging the data so that the logical methods of proof may be applied. Thus, the methods of agreement, difference, or concomitant variation (correlation) may all be used in drawing conclusions from a cross tabulation. There are no "tricks" of cross tabulation which can guarantee that an analysis will provide the most significant and meaningful results possible.

It is possible, however, to discuss some of the modes of thought which lead to fruitful cross tabulation. First of all the use of cross tabulation is in effect, an approximation of the controlled experiment. This means that the analyst is really thinking in terms of cause and effect, i.e. he has in mind one or more variables, variation in which can be used to explain variation in another variable. These "causal" dimensions are termed independent variables and the values to be explained are called dependent variables. It is because the analyst is really thinking in causal terms that there is a need for elaborating survey results through cross tabulation. If all that the analyst desires is an empirical statement of concomitant variation, simple cross tabulations will suffice. The need, however, to know the "meaning" of a relationship leads to asking many other questions which can be answered only by introducing other variables into the analysis.

In the most general sense it must be said that the whole process of analysis is not so much a matter of manipulative techniques as it is of the rigorous application of the basic principles of scientific method. The research worker who is fully acquainted with the problems of designing research will have fewer troubles in analysing his data.

Report Writing

L. Kothandaram Naidu

Research reporting is the oral or written presentation of evidence and the findings in such detail and form as to be readily understood and assessed by the reader and as to enable him to verify the validity of the conclusions. Research report writing is the culmination of the research investigation. It is at the stage of reporting that the researcher assembles the findings of the study, draws conclusions and evaluates his own findings. Report writing is thus the end product of a research activity. It is a highly skilled work as interesting, fascinating and at the same time challenging, gruelling and sometimes even exasperating experience. Writing a research report is a technical activity which demands all the skills and patience from the researcher. It requires "considerable thought, effort, patience and penetration and an overall approach to the problem, data and analysis, as well as firm control over language and greater objectivity". To write the report, a vast amount of planning and preparation is necessary for organising and writing the report. Besides, perfection in the research report is achieved by continuous and persistent thought and creative and intelligent writing. Only hard and patient work on the facts, careful and critical assessment and intelligent planning of the organisation of the report can facilitate communication. There is no standard criterion for the organisation of a report—popular or technical—for, the form depends on each investigation, problem, the novelty or familiarity of the methods, nature and volume of facts, techniques of analysis and so on. But, by and large there are a few guidelines. The report for the lay public should be simple, interesting and lucid. Similarly the research report for the administrator should neither be too general nor too technical.

A research report is meant for several categories of audiences viz., scientists engaged in fundamental research, those engaged in applied research, practitioners, policy formulators, funding agents or sponsors and the general public. The report should focus on the target audience and include the material of interest to other audiences only if it does not interfere with the material required to the specific audience. The material that would not be appropriate for the target group can also be separated from the text and incorporated in the footnotes or appendix. Uncertainty about target group results in ineffective communication.

Technical Report

A technical report is written for the fellow researcher and therefore should be organised on a different footing altogether. In such a report the researcher is expected to give a full account of the technical aspects both in the sampling methods and the subject matter. Fellow professionals are more concerned about the methods employed. In fact, the value of the findings and therefore of the report itself depends on the techniques adopted. Conceptual and analytical framework sample design should be adequately explained. M. H. Gopal mentions some distinguishing facts of a technical report:

1. The problem and its nature,
2. The method and scientific accuracy,
3. The data and their dependability,
4. The logical relationships of the data, and interpretation.

These facts have to be presented logically and sequentially with simplicity, clarity and brevity.

Planning and Organisation of a Report

Before starting the report writing a good deal of planning and organising the study materials form the basis of preparing the research report. While commencing the report writing the researcher does not know how to start writing. At the stage of writing, the researcher would have accumulated a mass of data and information, which have to be prudently and carefully used. Therefore, a well conceived planning and organising the report facilitates report writing with proper emphasis on different aspects. Planning permeates the entire report to each chapter, aspect and paragraph. It is nothing but arrangement of ideas in a logical and coherent manner within the framework of the overall structure laid down. Proper planning and organisation has the following advantages:

1. Ideas and facts which are relevant to the study alone are included,
2. The report gets greater clarity and unity,
3. Findings and results are easily communicated to the readers,
4. It facilitates transition in passing from one idea to another,
5. Ensures unity and sequence in presentation of facts, and
6. Results in an integrated and comprehensive research report,

Steps Facilitation a Good Organisation

Organisation of the research report involves three essential steps—(i) full acquaintance with research notes and organising it

properly, (ii) adequate thought about the structure of the report—reflective thinking; and (iii) formation and control over notes.

The very process of social research consists in noting down facts and making observations. Notes taking is the core activity of social research. Accuracy and utility of the notes taken from wide literature, as also from field observation has to be put to optimum use while writing the report. Methodical and systematic organisation of the notes is a prerequisite for effective report writing. While organising research notes the following points may have to be followed by the researcher:

1. To take down notes it is always better to use cards rather than the sheets of paper,
2. The cards have to be assorted and arranged topically,
3. After organising the notes, the researcher should consider the adequacy of the notes, if he finds that the note is inadequate, he has to gather additional information.

THE ROLE OF THOUGHT-REFLECTIVE THINKING

As research is not a mathematical process, thinking is necessary at every stage. For research is not merely the accumulation, evaluation and assimilation of facts. It is also more so rebuilding them into a meaningful whole. This demands patient, deep and alert thinking. Reasoning power of the research is the most efficient tool for research decisions, interpretation and generalisation and governing meaningful recommendation. Clear thinking alone results in clear writing of the report. As Whitney puts it, "There is a high positive correlation between good thinking and effective writing". The researcher must, therefore, develop his thinking faculty and train himself in the thinking process.

FORMATION OF SATISFACTORY OUTLINE

A bare outline is a 'must' in report writing and it is like 'the skeleton' in the human body. The outline of the research study is made at two stages. One at the beginning of the study which serves as a design of the study and second before writing the report. The outline prepared for the purpose of report writing should be elaborate so as to include all important aspects which should find a place in the report. To make the outline of the report writing elaborate it should be prepared at three stages; topical outline; paragraph outline; and sentence outline. Topical outline includes the Chapters and broad aspects to be included in each Chapter. It is a skeleton outline. Paragraph outline includes all major paragraphs indicating the central idea of each paragraph. Sentence outline does not in fact imply writing of sentences. It is merely composed of points to be included

in sentences. M. H. Gopal suggests the following points to be observed while planning on outline.

1. It should be as detailed as possible and should enable continuous writing;
2. It should not be vague and should not include such value phrases as 'introduction', 'body', 'conclusion', etc. which give no direction to the report writing.
3. It should fulfil the considerations of chronology, topical unity, coherence and transition; and
4. Each paragraph should contain one major idea.

The following outline may be adopted while preparing the research report;

OUTLINE

I. The Preliminaries:

1. Title page,
2. Preface or foreword, acknowledgements,
3. Graphs or illustrations, tables, charts,
4. Table of contents.

II. Contents of the Report:

1. Introduction:
 - (a) Objectives of the study, statement of the problem, hypotheses and definition of concepts,
 - (b) Review of literature and research studies,
 - (c) Time, place and materials of the survey;
 - (d) Scope, assumptions and limitations,
 - (e) Organisation and sampling procedures,
 - (f) Methods, tools and techniques employed for data collection.
2. Analysis and presentation of results:
 - (a) Report of facts—nature, volume and dimension,
 - (b) Statistical analysis of data,
 - (c) Interpretation, generalisation and conclusions,
 - (d) Summary of findings and recommendations.

III. The Reference Material:

1. Bibliography,
2. Appendices—Questionnaire, Statistical Tables, etc.,
- (3) Glossary of Terms,
- (4) Index.

CONCLUSIONS AND GENERALISATION

The primary task of the research is that the data presented in tabulation form should first be explained. He should avoid repeating the whole data that table contains. The statistical material presented in tables should be checked for statistical accuracy. Besides explaining tables he should interpret data on the basis of evidence. Such interpretation is the basis of generalisation. He should prefer understatement, instead of overstatement to retain readers' confidence. While drawing conclusions, the researcher should follow certain principles.

1. It is possible to come to opposite conclusions with the same material.
2. Other persons on the staff would reach the same conclusions with the evidence shown.
3. The conclusions are consistent with one another and with other known facts.
4. They seem to make sense and of not 'why.'
5. They are not to be coloured by the writers' personal biases.
6. Their meaning is unmistakable.
7. They could be accounted for by the survey techniques used.

Arrangement of Ideas

Arrangement of ideas and systematic presentation is an aid to evoke the interest of the researcher. The skilful writer leads his reader step by step through a well organised analysis of problem method, data and conclusion. Headings should be specific, brief and represent the content. Logical relationship of various points can be brought out of organising the points by appropriately employing centre headings, sub-headings, underlining, bold face type, etc. Besides there must be uniformity and consistency in the presentation of ideas. Punctuation, capitalisation, abbreviations, footnotes, quotations, acknowledgements and bibliography must follow a uniform pattern.

Writing Style

Utmost attention should be paid for writing the research report. The report is a communication between the researcher and the reader. It should be clear, easy to read and accurate in information and statements. Vagueness and generalisation will make the report incomplete. The essence of communication is clearly in presentation.

A few points to be kept in mind at the time of writing a report are:

The first step in clear presentation is clear thinking. Poor writing is largely due to hazy thinking. Research report writing is a reasoning process and without clarity of thought, there will not be clarity in writing.

The second step is that the researcher should have a good command over language. "Too frequently faulty sentence structure, illogical paragraphing, poor punctuation, incorrect spelling and other variations of English usage render an otherwise promising manuscript virtually worthless." At the same time one should not use complex high sounding language at the cost of clarity. The researcher should give importance more to clarity than style, facts than drama and incisiveness to persuasiveness.

The third point is brevity, one should take care of the economy of words and concentration of ideas. Repetition and superfluity will obstruct the lucidity of the report and will interfere with precision and clarity.

The fourth point is objectivity in report writing. One should write an unbiased, objective report fortified by facts.

Another important aspect of style is that colloquial or conversational modesty writing are inappropriate in a research report. As Anderson and others observe: "As a general rule, personal pronouns such as *I, We, You, Me, My, Our and Us* should not appear except in quotations. A thesis should not consist of the reporting of personal experience or opinion but should be critical analysis of a problem and this is better arrived at by using a tone of scientific impersonality". Readability is another factor which a researcher should keep in mind while writing a report. Sentences should not be too complex nor crammed with jargons.

A research report is meant for several categories of audiences viz., scientists engaged in fundamental research, those engaged in applied research, practitioners, policy formulators, funding agents or sponsors and the general public. The report should focus on the target audience and include the material of interest to other audiences only if it does not interfere with the material required to the specific audience. The material that would not be appropriate for the target group can also be separated from the text and incorporated

in the footnotes or appendix. Uncertainty about target group results in ineffective communication.

The three drafts

The research report should normally go through three drafts. The objective of the first draft is comprehensiveness and fullness of facts. In the second draft the report should be improved both in the form and the language by considerable trimming and pruning. Ideas and sentences have to be realigned so that the report gets clarity, order, logic, unity, coherence and naturalness. Furthermore, the researcher should avoid too much technical jargons, complex language and repetition. Presentation of research data in the form of charts and diagrams enables not only to present the data in a readable form but also helps the reader to understand the more complex tabulations.

The final draft concentrates on the finish and the final touches on documentation to make the report authoritative and convincing. Footnotes and bibliography makes the citations more authoritative, add to growth and continuity of knowledge and an acknowledgement of the benefits which the researcher received from others' writings. Footnotes serve the following purposes:

1. To acknowledge facts and ideas borrowed,
2. The researcher's contribution is distinguished from those of others,
3. The researcher is protected from being attacked by others,
4. It provides reference to a source which may be consulted for more details,
5. The larger context of the problem is indicated to the reader.

The footnotes must be relevant and the researcher must avoid the tendency to overwhelm the reader with quotations. Over documentation is bad, but under documentation is worse. Great discrimination has to be exercised in selecting the footnotes. There are, in fact, four facts of citation—which, when, how much and how to cite. One should learn the guiding principles of citation. The following are a few suggestions which the researcher should keep in mind:

1. Avoid citing authority for well known facts or statements,
2. Prefer scholarly editions to casual reports,
3. Prefer citing published sources,
4. Do not repeat in the footnotes what is already stated in the text,

5. If the citation is too long or contraversed relegate and discuss it in the appendix, and
6. If two or more previous writers have expressed one and the same idea, cite always the earliest writer.

An essential of a research report is bibliography. A bibliography is of two kinds: the working bibliography and the final bibliography. The final bibliography may take one or more forms.

1. To have single list for books, articles, reports, etc.,
2. Select bibliography,
3. Classified bibliography,
4. Critical bibliography.

A well done bibliography brings the author and the reader close and nothing impresses a fellow researcher more than such a bibliography.

Finally, the researcher must maintain ethical responsibility in writing the report. The researcher might have gathered informations promising to maintain confidentiality to the respondents. It is the moral responsibility of the researcher to protect his sources of information and should not reveal the identity of individuals. Secondly, the researcher should also ensure that data presented in the report are accurate, unbiased and there was no distortion. Any misrepresentation or incomplete presentation apart from damaging the development of scientific knowledge, may also bring discredibility to the researcher and to the community of researchers.

In the preparation of scientific report intellectual clarity and readability are important factors. Ultimate purpose of a report is to communicate the contents to the prospective users. Unless clarity is ensured the policy makers, practioners, intellectuals and public in general cannot make use of it. In such a case the very purpose of the report gets lost. The report writer should keep this in mind in finalising the report.

Social Science Research: Some Issues

E.G. Parameswaran

The past few decades have witnessed a rapid expansion in social science research. This expansion has been a result of advances in individual social science disciplines, an increasing awareness that suitable social technology has to be evolved to keep pace with advances in science and technology to ensure the maximum benefit for mankind, and of course, due increase in facilities and resources. This quantitative expansion of research has also brought along with it certain new trends in social science research. While one may not be exactly correct in calling these trends as new, nevertheless one may seek excuse under the fact that some of these trends have not found total awareness among social scientists and much less of acceptance. In view of this it appears reasonable and perhaps even necessary to examine some of these trends.

The Trend Towards Empiricism

Research in any discipline starts with observation of phenomena followed by theoretical analysis and explanation. This is true of any discipline of knowledge. However, in the course of the development of the research very soon one encounters a dilemma regarding the relative importance of theory and observation. Early research in social science research was dominated by master theories of Spencer and utilitarian philosophies. These master theories attempted to provide comprehensive and blanket explanations for all social processes and action. Very soon it was felt that such blanket theories which were reductionistic were far from adequate. The explanations offered by these theories were very stretched and tenuous. This experience resulted in a swing towards observation as primary and theory building is secondary and perhaps even unnecessary. This reaction against logical analysis and theory building led to a strong empiricist movement. The empiricist movement led to an accent on collection and analysis of data very often without any reference to theory. A rationalisation of this trend was the argument that social research should deal with actual day-to-day problems and serve as an instrument of practical change rather than aim at developing theoretical models and concepts.

To a certain extent perhaps, this view is undisputable. But anything in excess tends to become not only useless but perhaps counter-productive. One may pass to think whether this state of affairs has not been reached in the social sciences. Paradoxically enough much of the research in contemporary social sciences seems to fall into two inadequate categories: (a) too much of data and too little of theory, (b) too much of theory and too little of data. The number falling in the first category far outweighs the number in the latter. Fortunately, however, there are few instances where there is adequate balance of theory and data.

The consequence of this over-emphasis on empiricism has been a fall in the substantive quality of social science research resulting in unnecessary duplication of irrelevant micro-research. The undue premium based on amassing of empirical data has led to a flood of research which has been found to be not backed by logic nor followed by any practical utility. Useful research in social sciences should aim at an optimum combination of data and theory. One may start either with theory or with data. But if one starts with theory, it should be supported by data and data collected should confirm result in theory. The mushroom growth of survey research has contributed in no small measure to this tragic situation in social science research.

Along with empiricism has grown an obsession for quantification and statistical analysis. Any one who looks into some recent research papers in social sciences is both amazed and amused by the tendency to fill in pages with statistical tables which very often the reader finds unintelligible and perhaps sometimes the authors too. Quantitative analysis is, no doubt, a helpful and useful device for arriving at reliable and valid conclusions. But quantitative logic alone can never ensure the validity and reliability of research findings. The evidence of this is readily available when one comes across the glaring contradictions in the findings of different social researches directed to the same problem. Of course, in a very naive manner these contradictions are explained away on the basis of sample variations, individual differences, cultural variations etc.—confusion worse confounded. Very rarely does one come across any worthwhile amount of social science content in published research material.

Method or Technique

Social science research, very justifiably has adopted the models of researches in natural and exact sciences. No serious student of any science including the social sciences can afford to overlook or ignore the importance of scientific methodology. But unfortunately unlike their brethren in the natural and exact sciences, the social scientists have failed to make a clear distinction between method and technique. The distinction between the two is obvious. The former indicates the overall approach to the enquiry and the latter is a

more specific and narrow term. The failure to make a clear distinction between the two has caused not a little harm to social science research. The use of the questionnaire in social science research has assumed alarming proportions. A questionnaire is got ready, and the data is collected and freely interpreted. In many instances even the basic requirements of the proper procedure for developing the questionnaire are ignored. Even where they are not ignored, they are gone through in a very ritualistic manner. Questionnaires are constructed in the forenoon, data collected in the afternoon and the results are published the next day. While one may not dispute the need or even the desirability of using the so-called modern methods of data collection, at the same time one cannot help the feeling that often these are used as alibis to cover the absence of adequate conceptualisation and thinking. If one may attempt to read the thought process behind such researches, perhaps, it will run as follows:

"I have constructed a questionnaire in consultation with experts. I have also selected a sample using the table of random numbers. My data have been analysed by a computer and the report has been written. So my research must be good".

The use of the questionnaire, quantitative analysis and the 'gear' computer has in many instances tended to reduce social science research to a mechanical process of almost data manufacture.

The above lines are not meant to suggest any reversal of the above trends, but only to sound a note of caution that proper conceptualisation and formulation of research objectives and procedure can be sacrificed only at the peril of producing trash. While well developed tools of data collection and quantitative analysis can contribute to enhance the value of social science research, these steps cannot by themselves produce valuable research. Thinking about one's research is

Inter-disciplinary Research

It was pointed out in the beginning that, in its early stages social science research and analysis took the form of formulating comprehensive master theories which would explain the whole gamut of social phenomena. The classical theories of Spencer, Mill and perhaps even Marx are such attempts to explain different kinds of social phenomena on the basis of unitary explanations. Gradually, however, such master and unitary theories gave place to discipline-specific or area-specific theories resulting in segmental explanations of social processes. Thus the same phenomenon came to be explained by a psychological theory, sociological theory and an economic theory and what not? A stage was reached when different theories claimed to explain the same phenomenon but could not be reconciled between themselves. And when change or action programmes

were introduced on the basis of a discipline-specific theory, the inadequacies began to be felt rather sharply. This experience resulted in a rethinking regarding the adequacy of developing specific discipline-based theories, it was soon realised that social phenomena particularly relating to human behaviour had to be explained on a broader theoretical basis evolved by an integration of the approaches of different disciplines. It is this realisation which led to the emergence of inter-disciplinary research. In simple terms, inter-disciplinary research means attempting to evolve an approach to a research incorporating all the relevant findings of different disciplines. Today social scientists have realised the importance of this inter-disciplinary research and has been interpreted to mean inter-departmental research, a corruption introduced by the bureaucratic structure of the university system. In certain instances, this trend has gone to such an extent that a claim is made that every research should be inter-disciplinary (inter-departmental). The logic of this illogic has been the trend of allowing if not encouraging post-graduate students in one subject to work for a doctoral degree in another subject. It may be pointed out that inter-disciplinary research does not mean always that a sociologist, a psychologist, an economist, and political scientist should be assembled together to produce a meaningless mosaic. The concept of inter-disciplinary research only implies that the researcher should take into account the possibilities and perspectives of different kinds of processes that may operate in influencing the phenomena being studied. Ideally speaking, one does not produce an inter-disciplinary research by adding 20 per cent of psychology, 20 per cent of sociology and 30 per cent of economics and perhaps 30 per cent of other disciplines. Inter-disciplinary research is not an additive concept. It is more a chemical concept, where the approaches and findings of disciplines should be blended to provide a more meaningful and valid approach to the problem. The ideal solution for this will be to ensure that every researcher in social sciences has an overall awareness of the field of social sciences. The curriculum in social science programmes especially at the M.Phil. and Ph.D. level should be so formulated as to provide a wider vision to the researcher so that he is aware of the broader horizons.

In these few paragraphs an attempt has been made to focus the attention of the young researcher in the field of social sciences on some of the broader issues of social science research. These paragraphs may sound skeptical and optimistic. But cautious skepticism is to be preferred to baseless optimism and reckless enthusiasm.

Select Bibliography

- Ackoff, R., *The Design of Social Research*. Chicago: University of Chicago Press, 1953.
- Agnihotri, Vidyadhar, *Techniques of Social Research*. New Delhi, M. N. Publishers, 1980.
- Backstrom, C. M. and G. Hursh, *Survey Research*. Evanston, Ill.: Northwestern University Press, 1963.
- Bajpai, S. R., *Methods of Social Survey Research*. Kanpur, Kitab Ghar, 1966.
- Basu, M. N., *Field Methods in Anthropology and other Social Sciences*. Calcutta, Bookland, 1961.
- Blalock, H. M., *Casual Interferences in Non-experimental Research*. Chapel Hill: University of North Carolina Press, 1964.
- , *Social Statistics*. New York: McGraw-Hill, 1960.
- , *An Introduction to Social Research*. Englewood Cliffs, N. J.: Prentice-Hall, 1970.
- Blalock, H. M. and A. E. Blalock, eds. *Methodology in Social Research*. New York: McGraw-Hill, 1968.
- Campbell, D. and J. Stanley, *Experimental and Quasi-Experimental Design for Research*. Skokie; Rand McNally, 1963.
- Carroll M. Carole and Carrol, Frederic, *Methods of Sociological Research*. Meerut, Sadhana, 1976.
- Cochran, William, *Sampling Techniques* (2nd ed.) New York: John Wiley, 1963.
- Chapin F. Stewart, *Experimental Design in Sociological Research*. Harper and Bros, 1955.
- Clark, Jack Alden, *Research Materials in the Social Sciences*. Madison, University of Wisconsin Press, 1959.
- Conway, Freda. *Sampling: An Introduction for Social Scientists*. London: Allen and Unwin, 1967.
- Cotton, J. W., *Elementary Statistics*. New York: Pergamon, 1967.
- Dasgupta, Sugata, *Methodology of Social Science Research*. New Delhi, Impex, 1967.

- Dasgupta, A. K., *Methodology of Economic Research*. Bombay, Asia, 1968.
- Denzin, Norman, *The Research Act: A Theoretical Introduction to Sociological Methods*. Chicago: Aldine, 1970.
- Denzin, Norman (ed.), *Sociological Methods: A Source Book*. Chicago: Aldine, 1970.
- Direnzo, Gordon, *Concepts, Theory and Explanation in the Behavioural Sciences*, New York: Random House, 1969.
- Dornbusch, S. M., and C. F. Schmid, *Primer of Social Statistics*. New York: McGraw-Hill, 1955.
- Duverger, Maurice, *An Introduction to the Social Sciences*. New York: Praeger, 1964.
- Edwards, A. L., *Techniques of Attitude Scale Construction*. New York: Appleton-Century-Crofts, 1957.
- Festinger, Leon and Katz, Daniel, ed., *Research Methods in the Behavioural Sciences*. New Delhi: Amerind, 1970.
- Forcee, D. and S. Richer, eds., *Stages of Social Research: Contemporary Perspectives*. Englewood Cliffs, N. J.: Prentice-Hall, 1970.
- Franklin, B. and H. Osborne, *Research Methods: Issues and Insights*. Belmont, Calif.: Wadsworth, 1971.
- Franzblau, A. N., *A Primer of Statistics for Non-Statisticians*. New York: Harcourt Brace Jovanovich, 1958.
- Galtung, Johan, *Theory and Methods of Social Research*. New York: Columbia University Press, 1967.
- Ghosh, B. N., *Scientific Methods and Social Research*. New Delhi: Sterling, 1982.
- Goode, W. and P. Hatt, *Methods of Social Research*. New York: McGraw-Hill, 1952.
- Gopal, M. H., *Introduction to Research in Social Sciences*. Bombay, Asia, 1964.
- Greer, Scott, *The Logic of Social Inquiry*. Chicago: Aldine, 1969.
- Habenstein, Robert, *Pathways to Data: Field Methods for Studying Ongoing Social Organizations*. Chicago: Aldine-Atherton, 1971.
- Herring, Pendleton, *Developments of Social Science Research in India*, New Delhi, ICSSR, 1970.
- Hyman, H., *Survey Design and Analysis*. New York. Free Press, 1955.

- Hyman, Herbert et al., *Interviewing in Social Research*. Chicago: University of Chicago Press, 1954.
- ICSSR, *Asian Conference on Teaching and Research in Social Sciences*. May 21-26, 1973 at Simla, New Delhi, Association of Asian Social Science Research Council, 1973.
- ICSSR, *A Report on Social Sciences in India: Retrospective and Prospective*, New Delhi, ICSSR Review Committee, 1973.
- Junker, Buford, *Field Work: An Introduction to the Social Sciences*. Chicago: University of Chicago Press, 1960.
- Kaplan, Abraham, *The Conduct of Inquiry: Methodology for Behavioural Science*. San Francisco: Chandler, 1964.
- Kelman, Herbert, *A Time to Speak: On Human Values and Social Research*. San Francisco: Jossey-Bass, Inc., 1968.
- Kerlinger, F.N., *Foundations of Behavioural Research: Educational and Psychological Inquiry*. New York: Holt, Rinehart and Winston, 1964.
- Kish, Leslie, *Survey Sampling*. New York: John Wiley, 1965.
- Labovitz, S. and R. Hagedorn, *Introduction to Social Research*. New York: McGraw-Hill, 1971.
- Lazarsfeld, P. F. and Morris Rosenberg, *The language of Social Research* (rev. ed.). New York: Free Press, 1971.
- Lin Nan, *Foundations of Social Research*. New York, McGraw-Hill. 1976.
- Madge, J. H., *The Tools of Social Science*, London: Longmans and Green, 1953.
- Mann, Peter, *Methods of Sociological Enquiry*. Oxford: Basil Blackwell and Mott, 1968.
- McCall, G. and J. Simmons, *Issues in Participant Observation: A Text and Reader*. Reading, Mass. Addison-Wesley, 1962.
- McClosky, H., *Political Inquiry: The Native and Uses of Survey Research*. New York, Macmillan, 1969.
- Miller, D. C., *Handbook of Research Design and Social Measurement*. New York: Mckay, 1964.
- Moore, F. W., ed., *Readings in Cross-Cultural Methodology*. New Haven: HRAF Press, 1966.
- Moser, C. A., *Survey Methods in Social Investigation*. London: Heinemann Educational Books, Ltd., 1968.

- Mukherjee, P. K., *Economic Surveys in Underdeveloped Countries, A Study in Methodology*. Bombay, Asia, 1959.
- Myrdal, Gunnar, *Objectivity in Social Research*. London, Gerald Duck Worth, 1970.
- Parameswaran, E. G., and Ravichandra. K., *Experimental Psychology*. Delhi, Seema, 1983.
- Phillips, E. S., *Social Research: Strategy and Tactics*. New York: Macmillan, 1966.
- Plutchik, R., *Foundations of Behavioural Research*. New York: Harper and Row, 1968.
- Rajanna, B., *Fundamentals of Research*. Hyderabad, ASRC, 1968.
- Raj, Des, *Sampling Theory*. Bombay McGraw-Hill, 1968.
- Raj, Hans, *Theory and Practice of Social Research*. New Delhi, Surjeet, 1980.
- Ramachandran. P., *Training in Research Methodology in Social Science in India*. New Delhi, ICSSR, 1971.
- Rokkan, Stein, ed., *Data Archives for the Social Sciences*. Paris: Mouton Press, 1966.
- Rokkan, Stein, *Comparative Research across Cultures and Nations*. Paris: Mouton Press, 1968.
- Rose, Arnold, *Theory and Method in the Social Sciences*. Minneapolis: University of Minnesota Press, 1954.
- Sadhu, A. N. and Singh, Amarjit, *Research Methodology in Social Sciences*. Bombay, Himalaya, 1980.
- Schuessler, Karl, *Analyzing Social Data: A Statistical Orientation*, Boston; Houghton Mifflin, 1971.
- Sellitz, Claire et al., *Research Methods in Social Relations* (rev. ed.). New York: Holt, Rinehart and Winston, 1961.
- Sinha, Raghuvir, *Content Analysis: A New Method in Social Research*. New Delhi; Ambika, 1980.
- Simon, J., *Basic Research Methods in Social Science*. New York: Random House, 1969.
- Sjoberg, Gideon, ed., *Ethics, Politics, and Social Research*. Cambridge, Mass.: Schenkman, 1967.
- Sjoberg, G. and R. Nett, *A Methodology for Social Research*. New York: Harpers Row, 1968.

- Tandon, B. C., *Research Methodology in Social Sciences*. Allahabad, Chaitanya, 1979.
- Torgerson, W. S., *Theory and Methods of Scaling*. New York: Wiley, 1958.
- Wilkinson and Bhandarkar, *Methodology and Teachings of Social Research*. Bombay, Himalaya, 1979.
- Wilson, E. Bright, JR., *An Introduction to Scientific Research*. New York: McGraw-Hill, 1957.
- Young, P. V., *Scientific Social Surveys and Research*. Bombay, Asia, 1961.

Contributors

- S. C. Dube*: Renowned Sociologist and currently National Fellow of ICSSR.
- B. A. V. Sharma*: Professor of Political Science, Osmania University.
- K. Ilaiyah*: Documentation Officer, Department of Political Science, Osmania University.
- K. Raghavendra Rao*: Reader in Political Science, Karnataka University.
- R. Ravindra Sastry*: Lecturer in Political Science, New Science College, Hyderabad.
- D. L. Narayana*: Professor of Economics, Sri Venkateswara University.
- G. Haragopal*: Senior Fellow, Centre for Economic and Social Studies, Hyderabad.
- M. Vanamala*: Faculty Member, Institute of Public Enterprises, Hyderabad.
- C. M. Abraham*: Professor of Sociology, Bharathiar University.
- K. Ravichandra*: Lecturer in Psychology, Osmania University.
- P. Sandeep*: Lecturer in Non-Formal Adult Continuing Education, Osmania University.
- B. K. Manmohan Singh*: Lecturer in Psychology, Osmania University.
- P. Satyanarayana*: Deputy Director, ICSSR Southern Regional Centre.
- M. Yadagiri Reddy*: Staff Member, ICSSR Southern Regional Centre.
- D. Ravindra Prasad*: Reader in Public Administration, Osmania University.
- K. Madhusudhan Reddy*: Professor of Political Science, Osmania University.
- V. Sivalinga Prasad*: Reader in Public Administration, Osmania University.
- B. Satyanarayana*: Reader in Economics, Osmania University.
- F. D. Vakil*: Lecturer in Political Science, Osmania University.
- M. Ramchander*: Lecturer in Political Science, Government Women's College, Hyderabad.

- Shalini Bhogle:** Reader in Psychology, Osmania University.
- M. P. Sastry:** Professor of Statistics, Sri Venkateswara University.
- M. Pushpa:** Research Associate, Department of Non-Formal Adult Continuing Education, Osmania University.
- B. C. Muthayya:** Director of Psychology, National Institute of Rural Development, Hyderabad.
- M. Satyanarayana Rao:** Lecturer in Political Science, Government College, Khammam.
- R. Yadagiri:** Research Scholar in Political Science, Osmania University.
- T. Tirupathi Rao:** Lecturer in Political Science, Osmania University.
- L. Kothandaram Naidu:** Professor of Economics, Sri Venkateswara University.
- E. G. Parameswaran:** Professor of Psychology, Osmania University.

Index

- Abstracting Journals in India, 121-123
- Accidental Sample, 197
- Algo!, 244
- Allport, Gordon, 167
- American Institutionalism, 30
- Anthropological Survey of India, 8
- Aquinas, St. Thomas, 32
- Aristocracy, 37
- Aristotle, 31, 36, 37
- Aronson, 112
- Attitude Measurement, 202-4
- Attitude Scales, 220-1
- Augustine, St. 32
- Ballack, 177
- Behavioural Science Research, in India, 27
- Berelson, 159
- Bhandarkar, 43
- Bibliographies of articles literature published in India, 118-121
- Bibliographies of books published in India, 116-118
- Bibliographies of reference Sources, 125
- Bibliographies of Indian Government publications, 127
- Black, James A., 164
- Boas, Franz, 166
- Bogardus, E.S. 147, 164
- Books, Production in India, 113-115; information sources about; 116-127
- Boulding, Kenneth, 53
- Brown, 140
- Burger, 165
- Carlsmith, 112
- Case Study Method, 164-71; Evolution of, 165-6; Representativeness of, 166-7; Characteristics of 168; Techniques of, 169-70; Functions of 169; Limitations of, 170; Value of, 171
- Census Survey, 191
- Champion, Dean J., 164
- Chave, E.J., 221
- Cluster Samples, 195-6
- COBOL, 244
- Cocharan, 63
- Cohen, 43, 61
- Communist Party of India, 38, 40
- Congress Party, India, 38
- Content Analysis, 159-63; Applications of, 160-1; Characteristics of, 161-2; Uses of, 162-3
- Cox, 63
- Cumulative Scale, 227-8
- Data, Collection and Analysis of, 78-80, 87, 89, 93-9, 245-8; processing of, 232-44, 246-7; editing of, 233-5, Coding of, 235-41; tabulation of, 241-2, 246, 248; processing equipment of, 242-3
- Delhi University, 14
- Democracy, 37
- Descriptive Research Design, 90-95
- Dewey, John, 61
- Diagnostic Research Design, 95-112
- Dohrenwed, 208
- Dubois, Cora, 167
- Dutt, R.C. 10
- Easton, David, 44
- Educational Development in India, 17-20
- Einstein, 51
- Experimental Research Design, 102-112
- Exploratory Research Design, 99-101
- Fabian Socialism, 52
- Fisher, Irving, 57
- FORTTRAN, 244
- Gandhi, Indira, 40, 143
- Gandhi, M.K., 51; philosophy of, 52

- Gandhi, Sanjay, 39,
 George, W. H., 65
 Ghiselli, 140
 Gokhale, G.K., 10
 Goode and Hatt, 65, 66, 67, 129, 133,
 140, 147, 151, 155, 165, 171, 191
 Gopal, M.H., 252
 Green, 56
 Guttman, L., 220, 227, 228

 Hammond, 104
 Hatt, 65, 66, 67, 129, 133, 140, 147, 151,
 155, 165, 171, 191
 Healy, William, 165
 Hindu Philosophy, 35
 Hobbles, 32, 36
 Householder, 104
 Howard Psychological Clinic, 175, 176
 Humphrey, 161
 Hypothesis, 64-67, 76, 86, 93, 94, 107,
 134, 138, 190

 India; developing societies in, 4-5;
 social science research in, 7-27;
 growth of social science in, 10-27;
 universities in, 10-11; research insti-
 tutions in, 11; educational statistics
 in, 17; behavioural science research
 in, 27; book production in, 113-115
 Indian Council of Social Science
 Research (ICSSR), 11, 82; grant-in-
 aid statistics, 20-25; guidelines for
 the formulation of a research pro-
 posal, 83-9
 Indian Federal System, 40
 Indian University System, 10-11
 Inter-disciplinary Research, 259-60
 Interview, a method of research, 140-6;
 meaning of, 140-1; types of, 141-2;
 Process of, 142-3; limitations of,
 144-45; training for, 145-6; techni-
 ques of, 186-7

 Janata Party, India, 38
 Jawaharlal Nehru University, New
 Delhi, 14
 Judgement Sample, 196-7; and scaling,
 221-3
 Junker, Buford, 130

 Kalton, 155
 Kaplan, 104, 111, 205
 Katz, 99, 100, 101
 Kaul, T.N., 128
 Keynes, John Maynard, 53, 57
 Kinsey, Alfred, 166, 170
 Klein, 203
 Komarovsky, 170
 Kornhauser, Arthur, 153
 Korshadi technique, 175

 Lazarsfeld, 74
 Levitt, 175
 Likert, R., 220, 225, 226
 Lin, Nan, 135, 138, 187
 Locke, 32, 36
 Lundberg, George, 43, 64

 Machiavelli, 36
 McClosky, Herbert, 182
 McGuigan, 76
 Madge, John, 5
 Malthus, 51
 Marx, Karl, 29, 41, 51, 52
 Marxist discipline, 30, 33
 Mayo, Edton 170
 Measurement Methods, 200-6; concept
 of, 200; process of, 201; types of,
 202-4; problems in, 205-6
 Menzel, 74
 Methodological Adhocism, 31, 32
 Methodology for research; traditional,
 28-42; scientific, 43-9, 50
 Miller, Delbert, C., 154
 Mills, C. Galright, 64
 Mills, Judson, 103
 Monarchy, 37
 Moore, E.G., 34
 Moser, 155
 Mukherji, Radhakamal, 29
 Multistage Sample, 196
 Murray, 172, 175, 176
 Myrdal, Gunnar, 53, 58, 145

 Nagel, 45, 61
 Narayan, Jayaprakash, 39, 40
 Naoroji, Dadabai, 10

- National development; and Society, i-4
- Nayar, Kuldeep, 128
- Nehru, Jawaharlal, 40
- Nett, 128
- New York Times*, 161
- Newton, 51
- Nixon, Richard, 161
- Non-Probability Sample, 196-9
- Observation; a method of research, 128-38; process of, 134; problems and limitations of, 137-9
- Oligarchy, 37
- Osmania University, 75
- Palmar, 168
- Panchayat, 135, 142
- Panchayati Raj, 61, 143
- Patel, Sardar, 40
- Pearson, Karl, 43, 50
- Parsons, Talcott, 63
- Picture Frustration Test, 178
- Planck, (Proff), 53
- Planning Commission, India, 12, 13
- Plato, 31, 36, 37
- Platonic Republic, 36
- Play Techniques, 179
- Pluralism, 30
- Poverty, 3
- Probability Sample, 192-6
- Projective methods, 172-81; characteristics of, 174-5; projective techniques; evaluation of 179-81; projective tests; nature of, 173-4
- Purposive Sample, 197
- Quota Sampling, 197
- Queen, Stuart, A., 164
- Questionnaire, a method of research, 147-58; types of, 148-9; construction of 149-55; advantages of, 156-7; disadvantages of, 157-8; survey procedure of, 185-6
- Ram Reddy, G., 61
- Rapaport, 177
- Rating Scales, 229-31
- Report Writing, 249-56; Planning and Organisation of, 250-3
- Representative Sample, 196
- Research Design, 68-69; characteristics of, 68-70; components of, 70-82; evaluation of, 82; ICSSR Guidelines for the formulation of, 83-9; types of, 90-112.
- Richardson, 203
- Rogers, Carl, 170
- Rorschach, Herman, 174, 175
- Rousseau, 32
- Russell, Bertrand, 52
- Sampling methods, 190-9; types of, 192-9
- Saturation Sampling, 199
- Scaling techniques, 218-31; types of, 218-21
- Scientific Methodology, 43-9, 50; Objectives of, 44-6
- Second World War, 30
- Selltiz, 68, 100, 105, 106
- Shastri, Lal Bahadur, 40
- Shaw, Clifford, R., 166
- Shaw, George Bernard, 52
- Simple Random Sampling, 192-3
- Sjoberg, 128
- Smith, Adam, 57
- Snowball Sampling, 198-9
- Social attitude, 178
- Social Science; Role and function of, 1-9; and society 1-4; and national development, 4-5; growth in India, 10-27; doctorates in, 11; professional associations of, 15; Journals of, 15, 26; manpower in, 14-5; Marxist conception of, 29-33; scientific objectivity in 50-4
- Social Science Information; sources of, 113-27
- Social Science Research, 257-60; dissemination of, 5; in India, 7-27; methodology of, 28-50; 258-9; objectivity in, 55-60; design of, 68-89; trend towards, 257-8
- Social Science Research Council, 54
- Society; and Social Sciences, 1-4

- Sociometric, 134
 Sociometric Measure; construction of, 212-6; research application of, 216-7
 Sociometry Method, 207-17; nature of, 207; techniques of, 208-11; reliability and validity of, 211-2;
 Sorokin, 29
 Spatial Sampling, 199
 Spencer, Herbert, 165
 Stadmanjones, Gareth, 41
 Stevens, S.S., 218
 Stounffer, 166
 Stratified Random Sampling, 193-4
 Stricker, Goldfried, 175
 Survey Measurement, 202
 Survey methods, 182-9; characteristics of, 183-4; procedures in 184-5; problems of, 187-8
 Technical Report, 250; style of writing, 254-6; *see also* Report Writing
 Teacher Fellowship Scheme, 12
 Thaper, Romila, 41
 Thematic Apperception Test (T.A.J.T.), 175-7
 Thomas and Znaniecki, 166
 Thurstone, L.L., 220, 221, 227
 Traditional Methodology, 28-42; philosophical approaches in, 34-6; institutional approach in, 37-8; legal approach in, 39-40; historical approach in, 40-2
 Truman, David, 30
 Truummaa, 175
 Tyranny, 37
 Unit record equipment, 243-4
 University Grants Commission (UGC), 8, 12, 13; financial assistance to Universities, 20
 Von Hayek, Frederick, 53
 Wallas, Graham, 30
 Webbs, 128
 Weber, Max, 33
 Wilkinson, 43
 Woodworth, R.S., 61
 Young, Kimball, 166, 170
 Zahoda, 130
 Znaniecki, 166



Research Methods in Social Sciences

*B.A.V. Sharma *D. Ravindra Prasad *P. Satyanarayana*

007
SHA

The role of social sciences in socio economic and politico-administrative development of the country is being increasingly recognised. Social sciences have become an essential input in the transformation of the society. Besides universities, a large number of public and private organisations are promoting research in social sciences. Unfortunately, the literature on research methodology which can be useful for research workers and scholars in universities and institutions is very inadequate. This book partly fills the wide gap in the literature on social science research methodology. This introductory work covers many aspects of research methodology from formulation of research problem to the report writing. Varied techniques of data collection, processing and analysis of data are described in detail. Besides research techniques, the wider issues of role and function of social sciences research, traditional and scientific approaches objectivity, etc., are critically analysed.

The contributors to this volume include social scientists with varied and rich experience in research and are senior academics in universities and colleges. The book will be useful not only to research scholars, post-graduate students and teachers in universities and colleges but also to research workers carrying out social investigation in public and private agencies.

B.A.V. Sharma is Professor and Head, Department of Political Science, Osmania University.

D. Ravindra Prasad is Reader in Public Administration at Osmania University.

P. Satyanarayana is Deputy Director at ICSSR Southern Regional Centre, Hyderabad.

STERLING PUBLISHERS PRIVATE, LIMITED

ISBN 81 207 0024 4

Rs 30